

lake winnipeg, churchill & nelson rivers study board

CANADA
MANITOBA 1971-'75

recreation and archaeological studies

technical
report
appendix

7

LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD

APPENDIX 7 - RECREATION AND ARCHAEOLOGICAL STUDIES

A - LAKE WINNIPEG RECREATION DEMAND STUDY

B - RECREATION ASSESSMENT OF THE OUTLET LAKES AREA

C - RECREATION ASSESSMENT OF THE RAT-BURNWOOD DIVERSION ROUTE

D - RECREATION ASSESSMENT - SOUTHERN INDIAN LAKE

E - RECREATION ASSESSMENT OF THE LOWER CHURCHILL RIVER

F - AN ASSESSMENT OF THE ARCHAEOLOGICAL RESOURCES OF THE
OUTLET LAKES AREA

G - AN ASSESSMENT OF THE ARCHAEOLOGICAL RESOURCES OF THE
RAT-BURNWOOD DIVERSION AREA

LAKE WINNIPEG RECREATION
DEMAND STUDY

by

P. M. ASSOCIATES LTD.

sub-contracted by:

Research and Planning Branch
Manitoba Department of Tourism, Recreation and Cultural Affairs
Winnipeg, Manitoba
June, 1972

for

THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD

SPECIAL NOTE

THE CONCLUSIONS AND RECOMMENDATIONS CONTAINED IN THIS APPENDIX ARE THOSE OF THE AUTHOR(S) AND ARE NOT NECESSARILY THE SAME AS THE CONCLUSIONS AND RECOMMENDATIONS OF THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD AS EXPRESSED IN THE SUMMARY REPORT AND THE TECHNICAL REPORT.



inter-departmental memo

To:

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693 Taylor Avenue, Winnipeg

Date September 24, 1974

From

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Subject:

I have been reviewing the material which you sent me on the regulation of Lake Winnipeg and the estimated effects on the recreation resources, specifically the beach areas. Using the data that has been collected over the past years on the use of the provincial park at Grand Beach and mean July-August lake levels there appears to be no relationship between the levels of the lake and the use of the recreation resource with the exception of this year when lake levels were unusually high. The average relationship between water level increase and loss of beach area determined in the study (20% loss of beach width for each 1 foot of water level increase), would suggest a loss of 80-90% of the beach width at Grand Beach in July this year. From my observation this was generally the case. There was no coincident reduction in the recreation demand. The loss of the resource, as closely as can be determined from our present information, resulted in a 20% loss of the expected use of the park, a 20% loss of the market. Past years data suggests that this would occur only at such extreme water levels. This level of market loss might increase or it might decrease, if such levels persisted over time; there's no way of knowing at present.

If a straight line relationship were suggested between loss of the recreational resource and loss of market or diversion of use, it would have to be based on the results experienced this year, in which case, for each additional foot of mean water level a 5% loss in the recreational market would result. Based on the 1980 estimated total demand in visitor days of

2.

swimming-beach activity for Lake Winnipeg, this would amount to some 92,000 visitor days of use, or the equivalent of the use now experienced at a St. Malo Reservoir.

This type of simplistic calculation, however, has many short comings. The 1971 demand study indicates that overcrowding of the recreational areas on Lake Winnipeg is already occurring, and that to expect existing developed areas to accommodate the growth in demand between now and 1980 is unrealistic. The study estimates an excess in demand over existing capacity in 1980 of 222,000 visitor activity days. With a loss in recreation resources, this might be expected to increase.

I will be providing you with a more complete analysis in the form of a short report within the next two weeks. If you have any questions on this, please give me a call.



Neil Nixon

x.c. S. Trachtenberg
B. Nowicki
J. C. Mackay
D. Keates

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CHAPTER I

INTRODUCTION

A. Background

1. Recreation and Tourism Studies

Under the Canada-Manitoba Agreement of 1971 providing for overall study, two studies were to be undertaken to determine the influence of Manitoba Hydro's projects on the recreation and tourist industry.

First, a shoreline influence study for Lake Winnipeg was to be undertaken based on the results of the water regime studies. This study will define the influences of Lake Winnipeg regulation upon the usefulness of beaches and lowland cottage areas around Lake Winnipeg. This will permit a basis for mitigation.

The second study was to analyse the expected demand patterns of tourism in the entire study area, thereby translating the scope and direction of the tourist potential into dollar values. Where mitigation of losses is required, the funds are to be directed in accordance with the expected demand of tourism. The study was to include the selection of alternative regions for recreational development as well as to assess the recreation potential of the altered environment.

The growing economic and social importance of recreational and travel facilities to Manitoba has made it necessary for both government and private investors to undertake planning and development in this area. However, there has been no overall information base which indicates the present travel and leisure

time activities of Manitobans. Consequently, it has been almost impossible to plan a rational development of recreational and travel facilities within the province.

In late 1971, it became imperative that some information of this type be collected, not necessarily for all aspects of recreational travel, but more specifically with regard to recreation on or adjacent to Lake Winnipeg. This need arose as a result of the agreements to carry on more detailed studies on areas likely to be affected by the hydro-power development proposals for Northern Manitoba.

As mentioned above two separate studies would be undertaken to determine the influence of the proposed Hydro development projects on the recreation and tourist industry as it relates to Lake Winnipeg.

This original proposal has been somewhat altered. The first of these studies was not complete at the time of writing. This did not prevent the initiation of the second study but does impose some limitations on its results. It becomes impossible to evaluate future demand based on the restrictions which may be created by an altered environment. The only meaningful projections would therefore to be based on expectations given the assumption that no serious environmental changes occur as a result of the hydro developments. When the first study is completed there should be little difficulty relating

the results to the demand expectations and adjusting these projections accordingly.

The primary function of the second study would appear to be the collection of data that will provide some measure of present recreational use in the study area as well as forecasts of expected use under the assumption of no hydro developments. If this information can be formulated then alterations in the environment can be meaningfully expressed in terms of changes in demand and the need for alternative recreation sites.

One other significant change in the demand analysis was the disregard for translating tourism and recreation into dollar values. It is meaningless to transfer leisure time benefits into monetary values. The laissez-faire relationship of supply and demand does not exist in pricing policies for recreation because of governmental involvement. If a decision to proceed with any aspect of the hydro proposal is made on the criterion of maximizing benefits in terms of monetary values then the purpose of this study and the others initiated by the agreement will be lost.

This demand study was assigned to the Research and Planning Branch of the Department of Tourism, Recreation and Cultural Affairs. The branch designed a program which, given the constraints of the proposed study, sought to determine both use and supply data for the entire Lake Winnipeg region. More specifically, the program was

divided into two broad areas. The first was the design and implementation of a detailed survey to collect information relating to the travel and recreational habits of individuals living in Metropolitan Winnipeg. The second area was to deal primarily with the supply of recreational facilities which were considered to be a result of the water-orientated recreational capability of Lake Winnipeg. These two separate endeavours could then be integrated to provide the relationship between demand for recreation and supply of physical plant so as to develop accurate forecasting techniques. This section of the report provides the details on the methodologies employed in completing these two phases of the study.

The survey was restricted to the residents of Metropolitan Winnipeg for the sole reason that the cost of collection and the time constraints associated with this project rendered other alternatives unfeasible. It would have been possible to collect information on a province-wide basis had the method of survey been limited to a mail back variety but the reliability of results would be questionable. The information that has been obtained was collected via in-depth interviews based on a statistically reliable sample and this at least assures some measure of reliability in forecasting demands even though estimates for rural Manitoba will be required.

The first step was to develop a sample design. The sample design should make possible a statistically reliable and detailed analysis of the recreational habits of Greater Winnipeg residents. Specifically, the detailed purposes of this survey are:

- i) To collect data on the vacation and travel habits of Metropolitan Winnipeg residents traveling within Manitoba.
- ii) To collect data on the vacation and travel habits of Metropolitan Winnipeg residents traveling outside Manitoba.
- iii) To collect data on the leisure time and recreational activities of the residents of Metropolitan Winnipeg.
- iv) To collect data on the ownership and personal investment by Greater Winnipeggers in particular recreational and leisure time equipment.
- v) To collect the data in a manner which will permit a detailed analysis of the above characteristics by either geographical area or socio-economic groups.
- vi) To develop demand trends for the purpose of forecasting the future needs for recreational facilities within the province but specifically to relate these needs to the Lake Winnipeg study area.

It is extremely important that the results of this survey be statistically reliable so that demand forecasts will be valid and useful in anticipating the recreational requirements of the people to Metropolitan Winnipeg. In addition, it was considered essential that this survey should be conducted in a manner which would make its results compatible with Statistics Canada data and the results of the Domestic Travel Survey undertaken by the Federal

Government in cooperation with the provincial governments. It was felt that the greatest value of both surveys could only be realized if it were possible to group the results according to geographical areas in the event a cross reference is so desired.

It should be noted that the survey is the first of its kind to be conducted in Manitoba and because of this, it was necessary to analyse in great detail the specific requirements for selecting a representative sample. The final sample design allowed the study to be conducted efficiently and at a minimum cost.

Study Area

As the focal point of the study is to determine the recreation demand created by the existence of Lake Winnipeg, it would seem logical that the study area should be directly related to this body of water. Directly related means anything pertaining to activities which are a result of the existence of Lake Winnipeg; that is, any type or form of water-oriented activity. Since recreation is the major interest all shorelines bordering Lake Winnipeg are included within the study area.

However, shorelines alone do not encompass the total region of study. Since many other activities besides swimming, water skiing, boating, etc. are closely associated with water, it is desirable to include these activities in the report. This allows for an expansion of the study area to include such areas as:

- (a) Marshes and wildlife sanctuaries
- (b) Towns and villages
- (c) Resort areas: subdivisions
- (d) Accommodation sites
- (e) Provincial parks or campgrounds
- (f) Other areas

The very nature of recreation did not permit the establishment of rigid guidelines for a study area. Recreation is a concept which makes it difficult to define precisely which areas are truly related to recreation activities associated with Lake Winnipeg.

CHAPTER II

GENERAL OVERVIEW OF SURVEY RESULTS

A. The Composition of the Sample

1. Age Distribution

The questionnaire was designed and administered in a manner that made it possible to determine the overall size and composition of the household occupied by the primary respondent. Interviewers were required to list all members of the household, providing age, sex, and other socio-economic data. Table 1 outlines the age distribution of all household members contacted through primary interviewees. In total, there were 3,423 household members occupying the 1000 households interviewed, for an average household size of 3.423 persons. This sample statistic compares most favorably with the Statistics Canada estimate of 3.4 and it is therefore highly likely that the sample households interviewed in this survey were representative of the total population.

2. Distribution of Household Sizes

By utilizing the sample estimate of 3,423 persons per household and a population estimate for Winnipeg of 550,000 one obtains an estimate of 160,667 households for Winnipeg. Naturally, this statistic is very close to the Statistics Canada estimate of 161,000 because of the method of its derivation.

The distribution of the household sizes within the survey area is shown in Table 2. These results compare favorably with Statistics Canada estimates.

3. Other Indicators of Sample Reliability

The survey questionnaire requested information regarding the ownership of various types of recreational related assets and

TABLE 1

AGE DISTRIBUTION OF ALL HOUSEHOLD MEMBERS

<u>Age Group</u>	<u>No. Males</u>	<u>No. Females</u>	<u>Total</u>	<u>Percent</u>	<u>Estimates of No. People Based on 550,000 Pop.</u>
0 - 4	114	109	223	6.51	35,805
5 - 9	155	149	304	8.88	48,840
10 - 15	182	207	389	11.36	62,480
16 - 17	69	71	140	4.09	22,495
18 - 19	106	79	186	5.43	29,865
20 - 24	189	160	349	10.20	56,100
25 - 34	201	207	408	11.92	65,560
35 - 44	182	207	389	11.36	62,480
45 - 54	239	264	503	14.69	80,795
55 - 64	134	138	272	7.95	43,725
65 - 69	54	44	98	2.86	15,730
70+	82	80	162	4.75	26,125
Total	<u>1709</u>	<u>1714</u>	<u>3423</u>	<u>100.00</u>	<u>550,000</u>

Percent.

Average Household Size $\frac{3423}{1000} = 3.423$ persons.

TABLE 2

DISTRIBUTION OF HOUSEHOLD SIZES

<u>Household Size</u>	<u>Number</u>	<u>Percent</u>	<u>No. of Households Based on 550,000 Pop.</u>
1	93	9.3	14,942
2	285	28.5	45,790
3	199	19.9	31,973
4	185	18.5	29,723
5	123	12.3	19,762
6	61	6.1	9,801
7	25	2.5	4,107
8	14	1.4	2,249
9	7	0.7	1,125
10	3	0.3	482
11	1	0.1	161
12	2	0.2	321
13	1	0.1	161
14	1	0.1	160
15	0	0.0	0
16	0	0.0	0
17	0	0.0	0
18	0	0.0	0
19	0	0.0	0
	<u>1000</u>	<u>100.0</u>	<u>160,667</u>

it is possible from these answers to estimate the total ownership within the Winnipeg area. In most cases, alternatively derived estimates are either unavailable (water skis, snow skis, fishing equipment, hunting equipment, tent trailers, and camper units) or have been derived by very rough methods of estimation (motorboats, sailboats, canoes). However, the number of automobiles owned by residents of Winnipeg is available from motor vehicle registrations and is approximately 170,000. The estimate derived from the survey results is 167,953.

Similarly, the number of snowmobiles owned by the residents of Winnipeg, according to vehicle registrations is approximately 6000. The population estimate from the survey results is 8205. Although this is noticeably higher than the actual records indicate, the rapid growth of snowmobile ownership in Winnipeg serves to reduce the reliability of the historic records and increase the reasonableness of the survey estimates. In addition, the low incidence of snowmobile ownership combined with the sample size, increases in a statistical sense, the acceptability of the variance between the two estimates.

4. Conclusion

The sample of 1000 interviewees who responded to the survey questions was a representative sample of the population of Winnipeg and consequently the recreational patterns and demands they exhibit provide the basis for highly reliable estimates for the population as a whole.

B. Travel by Metropolitan Winnipeggers

Residents of Metropolitan Winnipeg spend a considerable amount of leisure time outside of the Metropolitan area. A large part of this leisure time is spent holidaying outside the province, not only in other parts of Canada but also in the United States and Continental Europe.

During the year for which data were collected, residents of Winnipeg spent 6,974,911 visitor days in various regions outside the province. Of this total, 4,254,532 of these visitor days were spent in other parts of Canada; 1,036,419 in the United States; 1,555,055 in Continental Europe and 106,825 in Mexico and the Caribbean Islands. Expressed in other terms: the average resident of Winnipeg spends about 12.68 leisure days per year outside the Province of Manitoba.

The number of leisure days spent traveling within the province is somewhat similar. During the summer months of May through September, the average resident of Greater Winnipeg spent about 13.63 leisure days traveling in the province. In total this amounted to 7,496,663 days of vacationing by Metro residents in the summer of 1971. The majority of this in-province travel took place in the Eastern Region (56.8 percent). The Interlake accounted for approximately 20.1 percent, the Western Region for 5.6 percent, Parklands accounted for 5.1 percent, the Northern Region for 4.5 percent, and the Pembina Valley and Central Plains Regions for approximately 4 percent each.

When a more specific analysis is done on the Lake Winnipeg Study area it becomes apparent that this area is a significant recreational resource. Nearly 31 percent of the total leisure days spent within the province by Metropolitan Winnipeggers in the summer of 1971 was spent within the confines of the designated study area and can be attributed to the presence of Lake Winnipeg's recreational attributes.

Although present use is not necessarily indicative of future demands for recreation there is no conclusive evidence to indicate the contrary. In fact, with the large development projects underway on Hecla Island and Grindstone Point and the extensive redevelopment of areas such as Gimli, Winnipeg Beach and Grand Beach, it would be realistic to assume that there will be a continued high level of demand for recreation in the study area.

The underlying variable in any demand analysis is, of course, capacity. A full or near full capacity situation in any given area will create the need for alternative recreational sites. As this study is limited to the analysis of use and demand patterns associated with recreation on Lake Winnipeg and cannot examine locational analysis based on alternative use theories, certain assumptions will be imposed upon the study. These assumptions are not intended to restrict the usefulness of future predictions but without firm policy direction regarding recreation development in the province there is no justifiable reason for allocating future demands on any basis other than present use. Capacity will then become the limiting constraint in predicting future use.

The analysis of the study area will be handled on a systematic basis. Each of the ten areas within the study region will be examined separately on the basis of supply, present use, and future demand.

The next chapter will be devoted entirely to the availability of recreational facilities and physical plant in the study region. This should provide some insight into those areas where one should expect higher use, as well as providing indications as to areas which can absorb future demand and those with near capacity situations.

Following this supply analysis, Chapter IV will examine each area on the basis of present utilization and expected future demand. Recreational activity will be isolated and examined according to its degree of interdependence on the water resource per se. By relating expected demand with present and future availability of physical plant, excess demand in given areas can be isolated, while at the same time areas with minimal use can be examined for future potential.

In any event, serious consideration should be given to that portion of recreational use which is clearly a result of the presence of the lake and its associated attributes. Any deterioration in the quality or quantity of these attributes will no doubt have serious implications for future recreational activity in those areas dependent on water-orientated recreational resources.

CHAPTER III

SUPPLY OF RECREATIONAL FACILITIES AND PHYSICAL PLANT

A. Supply

The presentation of the supply analysis deals with seven broad areas. Each will be dealt with separately, the amount of detail depending on the relative importance of each area as it relates to the study.

1. Accommodations (Lake Winnipeg Region)

The location of accommodation facilities is one of the main indicators in predicting recreational demand in any specific region. The Lake Winnipeg region is no exception, as most accommodation facilities and services are situated in the areas where recreational activity is the greatest. Alternatively, there is little recreation activity in areas where accommodation and facilities are minimal.

For the purpose of this study, accommodation facilities are defined as those facilities which enable a person or persons to remain overnight in a specific area. In other words, those facilities which provide sleeping accommodation (hotels, motels, cabins). Picnic sites, wayside rest areas, and other similar facilities are not included in the inventory of accommodation facilities.

Annex VI is a comprehensive accommodation chart for the Lake Winnipeg region. As indicated, this region has been subdivided into ten distinct areas. It is therefore possible to make comparisons between any of the geographic sub-areas with respect to the various types of accommodation units per

area, the fee structures of commercial accommodation units, and the approximate occupancy rates of some of the facilities. This breakdown into areas is also significant in that it permits an analysis of the interrelationships between the recreational demand for an area and the supply of facilities in that area. This will be explained in the next chapter of this report.

Tables 3 and 4 present a summary of the composition of accommodation facilities for the ten areas of the Lake Winnipeg region. In aggregate, there are 9,054 accommodation units available in the area, of which 6,708, or approximately 74 percent, are cottages. In addition, there are 1,623 permanent residential units in the area which represents approximately 18 percent of all units. The remaining 8 percent of the total units are divided between rental units, commercial establishments, seasonal resorts, and hotels.

Table 4 summarizes the percentage composition of Lake Winnipeg region accommodation facilities by area. It is immediately obvious that the supply of accommodation facilities in areas 8, 9 and 10 is virtually non-existent. Consequently, the reported use of such facilities in these areas by selected survey respondents must understandably be very low. This, naturally, should not be interpreted as indicating a lack of demand for these areas.

It would appear that the most intensive supply of accommodation facilities is in areas 3 and 4. Over 24 percent of the

hotel units are in either Grand Beach or St. Clements, over 30 percent of the motels and rental cabins, over 26 percent of cottages, and 28 percent of seasonal resort units.

Area 5, St. Andrews, is also extensively developed and offers 28 percent of the motels and cabin units and almost 40 percent of the cottages. Similarly, its commercial facilities are well developed, as over 28 percent of the commercial accommodation establishments are located in this area.

Area 6, Gimli, contains over 52 percent of the total residences in the region and almost 42 percent of the seasonal resorts. Similarly, almost 32 percent of the hotels and 24 percent of the motel and cabin units are located in this area. This pattern is a result of the extensive year round business community in the town proper.

The quality of accommodation units provided throughout the study area is generally low, as was found by the breakdown of the rental units according to the star rating system. This is natural, as the majority of the rental units cater to a seasonal trade only and this trade is generally recreation-oriented. The main exceptions are the motels in Gimli which cater to a year round business.

TABLE 3
 NUMERICAL COMPOSITION OF LAKE WINNIPEG REGION
 ACCOMMODATION FACILITIES BY AREA

Area	Name	Type of Accommodation (Number of Units)				
		Hotels	Motels and Cabins	Cottages	Resi- dents	Seasonal Commer- Resorts cial
1	Victoria Beach			952	33	6 13
2	Alexander	6		297	17	2 2
3	Grand Beach and					
4	St.Clements	16	93	1,758	105	21 36
5	St.Andrews		84	2,661	324	11 78
6	Gimli	21	73	961	845	31 94
7	Bifrost	23		27	294	3 55
8	Fisher			3	5	
9	Hecla		4			
10	All other areas		51	49		
TOTAL		66	305	6,708	1,623	74 278

2. Transportation Services and Accessibility to Lake Winnipeg Region

Accessibility to any area has a tremendous impact on the effective supply of recreational facilities available for use and the effective utilization of the facilities. In this context, accessibility is somewhat of a multidimensional characteristic. On the one hand, accessibility may be looked upon from the point of view of the variety of transportation facilities serving the area; on the other hand, from the point of view of the quality of transportation facilities available and the ease of access. In yet a different context, accessibility may be looked upon from the point of view of the location of the area relative to the location of the centres of population and the resulting time and transportation costs involved in gaining access to the area.

Sub areas 1 to 7 of the study area are reasonably close to the larger population centres and are all adequately serviced by road. In addition, most of these areas have available regularly scheduled bus and charter air services.

Areas 8 and 9 have adequate access roads, but are further removed from the centres of population and the quality of accessibility is less desirable. Area 10 has limited accessibility.

In interpreting recreational demand patterns, one must be fully cognizant of the fact that, as stated above, some of the areas have fully developed accommodation facilities while others

TABLE 4
PERCENTAGE COMPOSITION OF LAKE WINNIPEG REGION
ACCOMMODATION FACILITIES BY AREA

		Type of Accommodation (Per Cent of Units)					
Area	Name	Motels and Cabins			Resi- dents	Seasonal Resorts	Commer- cial
		Hotels	Cottages				
1	Victoria Beach			14.2%	2.0%	8.2%	4.7%
2	Alexander	9.1%		4.5	1.1	2.7	.7
3	Grand Beach and						
4	St.Clements	24.2	30.3%	26.2	6.5	28.4	12.9
5	St.Andrews		28.0	39.6	19.9	14.8	28.1
6	Gimli	31.9	23.8	14.3	52.1	41.9	33.8
7	Bifrost	34.8		.4	18.1	4.1	19.8
8	Fisher				.3		
9	Hecla		1.3				
10	All other areas		16.6	.8			
TOTAL		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

have virtually none. Naturally, if accessibility is poor, accommodation facilities will be minimal and the consequent utilization of the area will be limited.

The future development of transportation facilities and services will have a significant impact on both the recreational facilities offered to the public and their utilization. Therefore, the supply of recreation facilities in the Lake Winnipeg region and the future demand for such facilities cannot be projected without a thorough understanding of the proposed future transportation networks.

3. Natural Recreation Resources

(a) Wildlife Resources

The wildlife resources of Southern Manitoba are significant and consequently a high priority was given in the Lake Winnipeg Recreation Demand survey to measuring the utilization of these resources by the residents of Metropolitan Winnipeg. Only if a good understanding of both the wildlife resources and the utilization of these resources is achieved will it be possible to make a meaningful prediction of the future wildlife related activities.

Lake Winnipeg wildlife can be categorized into three main classes:

- i) Waterfowl
- ii) Upland game
- iii) Big game

i) Waterfowl

Waterfowl species include ducks and geese. Lake Winnipeg lies on the flight path of birds from both the Mississippi and Atlantic flyways.

An accurate estimate of the number of ducks and geese inhabiting the Lake Winnipeg basin is difficult to obtain. There was some attempt to pinpoint the number of waterfowl in this area by the consulting firm of G.E. Crippen and Associates. The purpose of their report was to document the importance of the Lake Winnipeg basin as a waterfowl recreation resource, and to assess the effects of four water regulation proposals compared with the unregulated condition on Lake Winnipeg. In attempting to assess the effects of regulations, it was first necessary for the consultants to locate and estimate the supply of the waterfowl in the Lake Winnipeg basin. Table 5 outlines the approximate area of nine major marshes in the Lake Winnipeg basin, along with counts of the breeding pairs of ducks for the respective marsh areas.

The number of breeding pairs was estimated in the Netley-Libau marshes by utilizing an observation of 23.2 breeding pairs per mile of marsh shoreline and the fact that there were 530 miles of shoreline. The product of 530 miles of shoreline and 23.2 observed pairs per mile is a population estimate of 12,300. On this basis, the pair density for the Netley-Libau marshes was 4.47 pairs per acre (55,000 acres divided by 12,300 breeding

pairs). Utilizing this density and the corresponding areas of the other marshes studied generated estimates of breeding pairs for each marsh in question.

The number of breeding pairs on the lake proper was calculated by utilizing an average of 2 pairs of ducks per mile of lakeshore line. By eliminating the major marshes from the Lake Winnipeg shoreline, an estimate of 1,800 breeding pairs was obtained for the lake proper.

It must be recognized that this information is only an estimate of the waterfowl population, but it does provide some quantitative data for the supply of waterfowl resources in the area.

As indicated in Table 5, the major waterfowl resources in the Lake Winnipeg region are found in the very southern portion of Lake Winnipeg and in the western area adjacent to Riverton and Grindstone Point. In other words, the major waterfowl concentrations are found in areas 4, 5, 7, 8, 9, and 10.

Any future projections of waterfowl resources within the study area must be made after careful analysis of the factors which affect such resources. One principal factor is the water level and overall condition of the marshes in which the birds nest. Therefore, prime consideration must be given to the proposed regulation of Lake Winnipeg and its subsequent effect on marshes. Whether the effects will favor or be adverse to the waterfowl resources can depend, among other things, upon the

TABLE 5

MAJOR MARSHES IN THE LAKE WINNIPEG BASIN AND THEIR
POPULATION OF DUCKS

Major Marshes	Acres	Miles Shoreline	Breeding Pairs
Netley - Libau	55,000	530	12,300
William Point	2,200		490
Riverton	5,400		1,210
Hecla Island	6,100		1,360
Washow Bay	4,500		1,010
Sturgeon Bay	15,000		3,360
Grand Marais	900		200
Victoria Beach	550		120
Beaconia	1,100		250
TOTAL MAJOR MARSHES 90,750			20,300
Lake Winnipeg	6,000,000	900	1,800
TOTAL BREEDING PAIRS			22,100

level of the regulation and the time of year during which water levels are altered. At a minimum, it is obvious that if Lake Winnipeg water levels are regulated without any consideration being given to the impact on the waterfowl resources of the area, the results could be disastrous.

ii) Upland Game

Although upland game are not directly water-orientated, a review of the upland game bird supply in the Lake Winnipeg study area is necessary, as the existence of this natural resource within close proximity to Lake Winnipeg has an impact on the recreational activity patterns in the area and therefore adds to the total recreation demand for the region. Upland game includes such game birds as ruffed grouse, spruce grouse, sharp-tailed grouse, Hungarian partridge, and ptarmigan. Grouse is by far the most prevalent species found in the Lake Winnipeg region.

Unfortunately there are very few statistics on the number of upland game birds in the Lake Winnipeg region. It is extremely difficult to estimate the population of upland game birds because the areas over which they are found are large and the birds do not concentrate in specific locations. Consequently, it is almost impossible to sample one small area and then project total area population based upon the size of the sample area relative to the size of the total area. The birds are not evenly distributed throughout the region and any simplified sampling approach is meaningless.

Mr. Ralph Urban, a wildlife biologist for the Department of Mines and Natural Resources has studied the location of upland game in the Lake Winnipeg region. According to his studies, the greatest supplies are found in areas 1, 2, 4, and 7.

iii) Big Game

Big game consists mostly of ungulates, such as deer, moose, caribou, and elk. Although such game does exist in the Lake Winnipeg region, the numbers are small compared to populations in more isolated areas of the province. Naturally, big game tends to avoid the encroachments of population and high density recreational areas. The exception to this generality is deer, which helps explain their presence in areas such as the Belair Forest Reserve and land immediately north of Gimli.

(b) Beaches

Beaches are the most important natural recreation resource as they support or attract virtually all swimming and boating activities. The Lake Winnipeg study area has miles of beaches and shoreline which are presently utilized for recreational activities. Victoria Beach, Grand Beach, Winnipeg Beach, and Hecla Island are prime examples.

For purposes of this study, shoreline, in order to be classified as beach, must be capable of supporting intensive recreational activities such as family bathing, swimming, sun bathing, paddling, camping, walking, unorganized games, gathering

and collecting, viewing, boat landing and launching, and water skiing. Thus, marshy shoreland and other areas which cannot support such recreational activities are excluded from this classification.

The Manitoba Department of Mines and Natural Resources has classified beaches on a scale of from 1 to 5. Class 1 and 2 beaches are considered to be prime beaches, while lower classifications are of inferior quality. Information for the location and classification of beaches in the Lake Winnipeg region was provided from the Canada Land Inventory Study. The accompanying map (Map 1) shows the location and classification of the major beaches within the region.

In addition to the classification of beaches as such, it is desirable to classify the land within the Lake Winnipeg region as to its capability for outdoor recreation. By demonstrating the land capability of the region, it is possible to compile a reasonably accurate inventory of natural outdoor recreational resources. The system used in the Canada Land Inventory classifies land according to its natural capability to provide opportunity for recreation.

The basis of the land capability system is to determine the quantity of recreation which may be generated and sustained per unit area of land per year under perfect market conditions. There are seven classes of land capability--class 1 to class 7. In addition, there are 25 sub-classifications based on the

recreational features of the area. The classification system contains more detail than required for the purposes of this study and therefore only a generalized summary of moderate and above outdoor recreational capability is presented in the Land Capability Classification for Outdoor Recreation map which is included as an annex to this report.

4. Man-Made Recreation Resources

(a) Water-Oriented Resources

A boating facility survey of Lake Winnipeg was conducted by the Manitoba Department of Tourism and Recreation. In general, the survey highlighted the fact that although boating activity is reasonably widespread throughout the lake area, there exists an extreme lack of modern, and in many cases adequate, boating facilities such as docks, boat launching ramps and marinas.

A study entitled "The South End of Lake Winnipeg Recreational Craft and Harbor Provisional Master Plan", completed by Createplan Ltd. for the Department of Tourism and Recreation and the Department of Mines and Natural Resources of the Government of Manitoba has provided an insight into the development capabilities of recreational boating on Lake Winnipeg. The background of material for the report was an analysis of the physical characteristics of the lake and the existing facilities together with other relevant data such as recreation trends and regional implications.

There are basically two types of recreational boating: family boating and deep water boating. Family boating is by far the most common type of recreational boating and is concerned with a variety of activities on small water bodies or sheltered portions of larger water bodies. Family boating is essentially "day boating", and consequently both launching facilities and parking spaces for cars and trailers are of critical importance. The areas which provide such launching opportunities in addition to docks and marinas are naturally the focal points for family boating, particularly if the backshore area permits the development of support facilities and road access.

Deep water boating is restricted to the larger water bodies and in the geographical area under study, is restricted largely to Lake Winnipeg. Deep water boating requires larger craft which usually have sleeping accommodations and safety features for extended cruising. The size of the craft and the nature of their use reduce the overall requirement for boat launching facilities but significantly increase the requirement for protected harbors, mooring facilities and adequate docks. In addition, the areas surrounding these facilities must be adequately prepared to ensure the safety of craft approaching and leaving the facilities. Maneuvering space, adequate water depth, channel markings and freedom from shifting sandbars or reefs are mandatory for these facilities.

The previously quoted study has presented the following inventory of existing and potential harbors and present boating facilities for each of the sub areas under study within the Lake Winnipeg region:

Area No. 1

Victoria Beach- a dock exists which contains a 320-feet approach wharf plus a 280-feet by 25-feet outer wharf. The dock is somewhat exposed to winds and waves from the southwest; a boat launching ramp exists near the end of the dock.

Area No. 2

Hillside Beach- a boat launching ramp exists, but there is no dock. The area is reasonably well protected from both winds and waves. Water approaches to this area are limited to small craft.

Fort Alexander- within the Reserve area there are numerous natural harbors and some homemade docks. However, most of these docks are vulnerable to storms.

Area No. 3

Grand Beach Provincial Park- this harbor is characterized by a large lagoon fronted by a high stable pressure ridge and backed up higher wooded land. The area is slightly exposed to wind, but has excellent protection from the lake. Boat launching facilities are in existence but there is no dock. The use of

this area is definitely restricted to small craft for family boating.

Area No. 4

Area 4 is almost void of any public boating facilities, although some private facilities occur on the shoreline adjacent to the Scantbury Indian Reserve. Any family boats are usually moored out from the shore and must be reached by smaller craft.

Area No. 5

Winnipeg Beach- the harbor for Winnipeg Beach is located at the mouth of Boundary Creek. The inside portion of the harbor forms a smallcraft marina while the outside portion is suitable for largercraft. The harbor has fairly good protection from both wind and waves. There are docks for small craft and a 325-foot wooden pile walkway for deep water boats. Boat launching facilities are also provided.

The southern portion of this study area consists mostly of swamp and marshland. Boat launching ramps are provided on or near Netley Lake and Creek. Access from this area to Lake Winnipeg may be made by boat.

Area No. 6

Gimli- a man-made harbor has been provided and is protected by a breakwater structure. The entrance to the harbor is very susceptible to rough seas and the harbor, in general, is

exposed to both wind and waves. A 750-feet by 26-feet concrete deck main wharf has been provided as well as a 400-feet by 16-feet planked deck inner wharf and a 550-feet by 14-feet rock filled outer breakwater. The boat launching ramp is adjacent to the main wharf.

Arnes - an L-shaped timber decked dock with a 260-feet by 15-feet approach and an 80-feet by 60-feet arm has been provided on the south side of Druken Point, adjacent to a large lagoon. The wharf is exposed to winds and waves from nearly all directions.

Area No. 7

Hnausa - a harbor has been provided by a 470-feet by 15-feet boulder crib breakwater jetty which extends southeast from the shore. A main wharf, 375-feet by 26-feet with a 96-feet concrete decked arm and an inside harbor wharf 120-feet by 14-feet have also been provided. A boat launching ramp for small craft is available. The exposure of this harbor to the wind is fairly intense and waves break onto the wharf from the exposed directions.

Riverton - an approach from the Riverton harbor to Lake Winnipeg is made by way of the Icelandic River. A 300-feet timber-decked wharf is located within Riverton on the north side of this river. The first 200-feet of this wharf is 20-feet in width while the last 100-feet is 16-feet in width. Wind and wave

protection is excellent.

Area No. 8

There are no man-made harbors in this area. There is a dock at Albert Harbor and the only boat launching ramp is at Islandview.

Natural harbors exist at Wells, Albert, Janora, and Little Grindstone.

Area No. 9

Hecla- a partial natural harbor created by a large embayment in the shoreline has been protected by a number of artificial structures, but remains exposed to northeast wind and wave action. A 500-feet by 50-feet concrete deck wharf and a 50-feet pole dock have been provided.

Gull Harbor- a large natural bay created by the shore of the island and a long limestone shingle bar are available for pleasure craft. The harbor is well protected from both wind and waves. A planked dock 450-feet by 22-feet and a wooden pile wharf 125-feet by 10-feet are provided.

Area No. 10

There are numerous natural harbors on the northern portion of Lake Winnipeg within the region of this study. Since the area is so large, accessibility so limited, and the facilities so minimal, only a list of those harbors which have docks

is provided below:

Black and O'Hanley Estuary
Hole River
Loon Bay Dock
Calders Dock
Loon Dock
Pine Dock
Matheson Island
Grand Rapids
Berens River
Warren Landing
Norway House

In addition to the above facilities, boat launching ramps are also located at Beaver Creek.

(b) Other Man-Made Recreation Resources

i) Summer Recreation Facilities

The primary man-made summer recreation resources are community centres and other similar facilities which make possible an organized form of indoor or outdoor recreation.

Organized recreational facilities within the study area include those facilities which are under the supervision of the local communities around Lake Winnipeg. In most cases, both the financial and administrative responsibilities are met by the local population.

Although the community centres' main function is to supply local residents with opportunities for recreation, they are not restricted to use by local residents. Under many circumstances, visitors from other regions of Manitoba participate in community centre sponsored recreational activities such as golf

tournaments, baseball games, community hall functions and theatres. In the winter, sponsored activities include curling bonspiels, hockey games, and other indoor activities.

The major source of information on the supply of community centre recreational facilities is the "Recreation Facility Inventory Survey" which was conducted in the summer of 1971 by the Department of Tourism, Recreation and Cultural Affairs. This survey included only those communities with populations over 50 and thus some communities have been excluded. In these cases, supplementary sources of data have been relied upon. Annex VII presents a summary of the summer and winter facilities provided in each of the study areas.

ii) Winter Man-Made Recreational Resources

The nature of many winter recreational activities does not require man-made facilities and thus the activity may be undertaken in all areas. It is therefore unnecessary to attempt to measure the supply of recreational facilities for such winter sports as cross country snow skiing, snowshoeing, tobogganing, snowmobiling and ice fishing.

Other winter activities do require manmade facilities and the supply of these facilities within the study region will be highlighted. Primarily, the facilities required are winterized community halls, indoor iceskating rinks, outdoor iceskating rinks and gymnasiums. These facilities have been listed by area in Annex VII.

CHAPTER IV

RECREATIONAL ANALYSIS OF STUDY AREA

This chapter presents a detailed analysis of present use and future demand projections for recreational activity in the study area. The ten areas will be examined separately and in the formulation of future expectations, consideration will be given to available supply and long term capacity implications. As stated earlier, it is beyond the scope of this study to analyse this demand and allocate any excess on the basis of a provincial wide alternative location analysis. This would necessitate knowledge of future development plans, both private and public, as well as demand and supply information for all other regions in the province.

The approach followed in this analysis, although done in isolation, can provide a measure of expected demand for recreation on Lake Winnipeg. The assumption that is required is that recreational development will continue to take place in patterns similar to the past resulting in no changes of significant magnitude to alter present use patterns to any measurable extent. This is not an unrealistic assumption in a situation of limited availability of outdoor, water-orientated recreation resources.

The limitations of the survey have been discussed in previous sections, but it is necessary to clarify the procedure used to expand the survey results beyond the confines of Metropolitan Winnipeg. Because the survey was limited to interviews within Metropolitan Winnipeg, it is obvious that estimates will be required for use and demand arising from rural areas adjacent to the study

area, use and demand created by other areas of the province, and use and demand as a result of out of province visitors. Estimates of this nature are not only difficult to make but are extremely difficult to integrate with the study data. Fortunately, the Department of Tourism, Recreation and Cultural Affairs has spent considerable time analysing campground use within the province and relating this use to origins of users. This information was not based on sampling techniques but was in fact obtained by a thorough examination of all camping permits issued in the province in the summer of 1970.

The data indicated that approximately 80 percent of all use on Lake Winnipeg is attributable to residents of the Metropolitan Winnipeg area. The remaining use is primarily the result of visits by other Manitobans. Very little use of the Lake Winnipeg area was found to be made by residents outside the province. Therefore, in estimating total use and future demand for recreation in the designated study area an additional 20 percent will be added to the use created by residents of Winnipeg. As this estimate was formulated on solidly researched information it should provide adequate formulations of total use.

A. Methodology

The analysis of present use and expected future demands for recreation in the Lake Winnipeg region must be related to the need to participate in water-orientated recreational activities. Water-orientated activities such as swimming, fishing, and boating provide the basis for the recreational activities studied and the related developments. It is mandatory to assume that activities which are not water-orientated are of secondary importance or complementary in nature. The primary attraction is the water and the related resources and as the quality and quantity of these vary then so does the level of use. There is a direct relationship between these variables and no amount of complementary development can attain the level of recreational use that is possible in the presence of adequate water-orientated resources.

This phenomenon will be illustrated for each of the ten areas in the designated region. First, information will be provided outlining the actual levels of use during the summer of 1971. The magnitude of use was measured in visitor days by type of accommodation used, length of stay, weekday or weekend visitation, and age categories of visitors. Secondly, data on levels of participation by various activities clearly highlight the importance of water-orientated activities on the overall use of the study area as a recreation resource. Obviously, those areas

which provide greater recreational opportunity (quality and quantity of recreational resources) receive more intensive use than those which are limited in resources. The information on activity participation is expressed in such a manner that it is possible to relate the total visitation in any given area to the desire to participate in specific activities. Therefore, to determine levels of use all that is needed is information on the quantity and quality of recreation resources related to the activities under study.

Thirdly, projections of activity participation are developed for 1975 and 1980. These demands are based solely on population increases and increased levels of leisure time. No consideration is given to resource limitations, altered environments, or new development programs. These isolated projections are then adjusted to reflect the more obvious resource limitations and development programs; adjusted by modifying the relationship between activity participation and visitor use. As recreational opportunity decreases, either as a result of resource deterioration or capacity limitations, then there are only three alternatives: reduction in visitor use, reductions in activity participation, or some combination of both.

If it is possible to isolate the difference between this adjusted level of use and the desired level of use then we will have some measure of the unfulfilled need for recreation activity participation. This can then be translated into visitor use by examining the resource potential of alternative areas and determining their ability to absorb these activity needs.

B. Presentation of Data

1. Format

The presentation of all data is divided into ten sections, one for each of the study areas. Each section contains three tables:

- 1) Visitor use- May 1 to September 30, 1971. These tables are labelled as "A" tables.
- 2) Activity participation, 1971. These tables are labelled as "B" tables.
- 3) Projected demand 1975 and 1980 (summer). These tables are labelled as "C" tables.

In addition to the three tables each section contains a list of assumptions used in adjusting levels of activity participation for the years 1975 and 1980.

2. Glossary of Terms

(a) Trip

One person making one trip to a specific area. Two trips by the same person are recorded as two trips.

(b) Accommodation Type

Main type of accommodation used while on a specific trip to a specific area.

(c) Visitor Day

One person in a specific area for one day. There is no restriction on the numbers of hours per day.

(d) Activity Day

One person participating at least once in a given activity on a given day in a specific area.

(e) Activity Days Per Visitor Day

For each visitor day in a specific area the number of activity days for all activities are determined. These are summed to provide the total number of activities participated in per visitor day. These will be referred to as activity factors and abbreviated as "A.F.".

3. Explanation of "C" Tables

Column 1

Number of activity days per activity for Metropolitan residents in the summer of 1971.

Column 2

These are total activity days per activity. They include 20 percent increase for: a) residents of Manitoba other than from Metropolitan Winnipeg; b) visitors from other than Manitoba.

Column 3

Projected activity participation for 1975. Based on 4 percent increase in Manitoba's population plus an additional 5 percent increase in leisure time activity.

Column 4

Projected participation for 1980, based on 9 percent increase in population plus 10 percent increase in leisure time activity.

Column 5

These are adjusted activity factors applicable to 1975 projections. These are adjusted 1971 factors altered to reflect resource limitations and development programs.

Column 6

Adjusted activity days, 1975.

Column 7

This column indicates excess demands as at 1975 for individual activities.

Columns 8, 9, 10

Similar to columns 5, 6, and 7 but applicable to 1980.

AREA 1

VICTORIA BEACH

TABLE 1A

VICTORIA BEACH VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

Average Stay Per Trip - 2.70 days					
Weekends - 1.51 days					
Weekdays - 1.19 days					
TOTAL NUMBER TRIPS - 113080					
Number Visitor Days					
Accommodation Type		Metro			Per Cent
		Residents	Other	Total	
Cottage	91348 x 2.81	256687	51377	308064	84.1%
Camping	737 x 2.81	2071	414	2485	.7
Friends and Relatives	13988 x 2.81	39551	7910	47461	12.9
Day Visits	<u>7007</u> x 1.0	<u>7007</u>	<u>1401</u>	<u>8408</u>	<u>2.3</u>
TOTALS	113080 x 2.7	305316	61102	266418	100.0
Exclusive of Day Visits - Average Stay = 2.81 Days					
Per Cent Weekend Use = 55.9%					

PER CENT VISITOR DAYS BY AGE GROUP

Age	Per Cent
0 - 4	0.0%
5 - 9	16.9
10 - 15	14.0
16 - 17	.5
18 - 19	2.4
20 - 24	7.7
25 - 34	3.5
35 - 44	11.9
45 - 54	21.6
55 - 64	21.3
65 - 69	0.0
70 plus	0.2

TABLE 1B
VICTORIA BLACH
ACTIVITY PARTICIPATION, 1971

Summer Activity	Activity Days			Supply
	Metro Residents	Per Cent	Per Visitor Day	
Swimming	204050	58.7%	.668	3 Class 1 3 Class 3
Fishing - boat	3630	1.0	.012	
Fishing - no boat	17655	5.1	.058	Pier
Motor boating	22825	6.6	.075	Pier, ramp, natural harbor
Sailing	16170	4.7	.053	Yacht club
Canoeing	11000	3.2	.036	
Other boating	3300	1.0	.011	
Water skiing	5885	1.7	.019	
Picnicing	12155	3.5	.040	
Horseback riding	3630	1.0	.012	Riding stables
Golfing	22825	6.6	.075	9-hole course
Tennis	14355	4.1	.047	3 tennis courts
Special events				
- Spectator	6215	1.8	.020	
- Participant	3630	1.0	.012	
Waterfowl hunting	-	-	-	
All other hunting	-	-	-	
TOTALS	347325	100.0	1.138	

Number of activity days per visitor day

$$= \frac{347325}{305316} = 1.138$$

TABLE 1C

PROJECTED DEMAND 1975 AND 1980 (SUMMER) - VICTORIA BEACH

Activity	Metro			Adjusted Activity			Adjusted Activity			Adjusted Activity			Excess Demand		
	(1)	(2)	(3)	1980	A.F. 1975	(5)	Days 1975	(6)	A.F. 1980	(8)	Days 1980	(9)	1975	(7)	1980
				(4)											(10)
Swimming	204050	244860	266897	291383	.600		218899		.600		235088		47998		56295
Fishing															
- boat	3630	4356	4748	5184	.012		4378		.012		4702		430		482
- no boat	17655	21186	23093	25211	.050		18242		.045		17632		4851		7579
Motor boating	22825	27390	29855	32594	.075		27362		.075		29386		2493		3208
Sailing	16170	19404	21150	23091	.053		19366		.053		20766		1784		2325
Canoeing	11000	13200	14388	15708	.036		13134		.036		14105		1254		1603
Other boating	3300	3960	4316	4712	.011		4013		.011		4310		303		402
Water skiing	5885	7062	7698	8404	.019		6932		.019		7444		766		960
Picnicing	12155	14586	15899	17357	.040		14593		.040		15673		1306		1684
Horseback riding	3630	4356	4748	5184	.012		4377		.012		4702		429		482
Golfing	22825	27390	29855	32594	.060		21890		.050		19591		7965		13003
Tennis	14355	17266	18776	20499	.040		14593		.040		15673		4183		4826
Special Event															
- Spect.	6215	7458	8129	8875	.020		7297		.020		7836		832		1039
- Part.	3630	4356	4748	5184	.012		4378		.010		3918		430		1266
Waterfowl hunt.	-	-	-	-	-		-		-		-		-		-
All other hunt.	-	-	-	-	-		-		-		-		-		-
TOTALS	347325	416790	454301	495980	1.040		379424		1.023		400827		75024		95154
Activity Days per															
Visitor Day	1.138	1.138	1.138	1.138	1.040		1.040		1.023		1.023				
VISITOR DAYS	305206	366247	399210	435834	364831		364831		391814		391814				

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY

FACTORS 1975, 1980 - AREA 1

1. Swimming activity factor is adjusted in 1975 to reflect overuse of existing resource. Total visitor days cannot increase indefinitely without some overuse of beach resources and appropriate decline in their use.
2. A small adjustment is made to the fishing - no boat category in 1980 reflecting overuse of pier facility.
3. Adjustments are made to golfing activity in both 1975 and 1980 to reflect the limitation of such a resource.
4. An adjustment is made to the tennis activity in 1975 to reflect the limitation of this manmade resource.

Conclusion

Note the effect of an approximate 10 per cent decrease in the activity factor for swimming. In 1971 approximately 66.8 per cent of all visitors went swimming each day. Because this activity is in fact the basis of recreational use in this area only slight declines in the swimming resources will cause meaningful reductions in the amount of activity participation per visitor day. This is an unacceptable situation and will therefore cause a reduction in the demand for visitor use in the area as people will seek alternative locations where they are able to seek higher participation levels. It is only in a situation of

negligible alternative resources that visitors will allow visitation to increase by accepting a lower level of activity participation.

Majority of the excess demand is clearly attributable to swimming. As stated, this is a limiting factor in projecting demand for water-orientated recreation resources. Golf and other similar activities can be carried out in a variety of locations but when preference is given to locations on or about Lake Winnipeg the motive is complementary only.

AREA 2

ALEXANDER

TABLE 2A

ALEXANDER VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

Average Stay Per Trip - 3.34 days					
Weekends - 1.82 days					
Weekdays - 1.52 days					
TOTAL NUMBER TRIPS - 63690					
		Number Visitor Days			
Accommodation Type		Metro Residents	Other	Total	Per Cent
Motel	1102 x 3.44	3791	758	4549	1.8%
Lodge	363 x 3.44	1249	250	1499	.6
Cottage	56690 x 3.44	195014	39002	234016	91.6
Camping	2942 x 3.44	10148	2030	12178	4.8
Friends and Relatives	0	-			
Day Visits	<u>2593</u> x 1.0	<u>2593</u>	<u>518</u>	<u>3111</u>	<u>1.2</u>
TOTALS	63690 x 3.34	212795	42558	255353	100.0
Exclusive of Day Visits - Average Stay = 3.44 Days					
Per Cent Weekend Use = 51.6%					

PER CENT VISITOR DAYS BY AGE GROUP

Age	Per Cent
0 - 4	13.5%
5 - 9	0.0
10 - 15	24.2
16 - 17	15.9
18 - 19	0.0
20 - 24	1.9
25 - 34	8.7
35 - 44	20.2
45 - 54	15.6
55 - 64	0.0
65 - 69	0.0
70 plus	0.0

TABLE 2B
ALEXANDER
ACTIVITY PARTICIPATION, 1971

Summer Activity	Activity Days			Supply
	Metro Residents	Per Cent	Per Visitor Day	
Swimming	118250	71.5%	.556	2 Class 1 2 Class 3
Fishing - boat	1815	1.1	.009	
Fishing - no boat	15455	9.3	.073	
Motor boating	715	.4	.003	Ramp
Sailing	-	-	-	
Canoeing	1100	.6	.005	
Other boating	2200	1.3	.010	
Water skiing	-	-	-	
Picnicing	19140	11.6	.090	
Horseback riding	3630	2.2	.017	Riding stables
Golfing	1430	.9	.007	No golf course
Tennis	-	-	-	
Special events				
- Spectator	-	-	-	
- Participant	1815	1.1	.009	
Waterfowl hunting	-	-	-	
All other hunting	-	-	-	
TOTALS	165550	100.0	.778	

Number of activity days per visitor day

$$= \frac{165550}{212795} = .778$$

TABLE 2C

PROJECTED DEMAND 1975 AND 1980 (SUMMER) - ALEXANDER

Activity	Metro (1)	Total (2)	1975 (3)	1980 (4)	Adjusted A.F. 1975 (5)	Adjusted Activity Days 1975 (6)	Excess Demand 1975 (7)	Adjusted A.F. 1980 (8)	Adjusted Activity Days 1980 (9)	Excess Demand 1980 (10)
Swimming	118250	141900	154671	168861	.556	163262	(8591)	.550	183000	(14139)
Fishing										
- boat	1815	2178	2374	2592	.010	2936	(562)	.010	3327	(735)
- no boat	15455	18546	20215	22070	.070	20555	(340)	.070	23291	(1221)
Motor boating	715	858	935	1021	.010	2936	(2001)	.020	6655	(5634)
Sailing	-	-	-	-	.005	1468	(1468)	.010	3327	(3327)
Canoeing	1100	1320	1439	1571	.010	2936	(1497)	.020	6655	(5084)
Other boating	2200	2640	2878	3142	.010	2936	(58)	.010	3327	(185)
Water skiing	-	-	-	-	.003	881	(881)	.005	1664	(1664)
Picnicing	19140	22968	25035	27332	.090	26427	(1392)	.080	26618	714
Horseback riding	3630	4356	4748	5184	.017	4992	(244)	.017	5656	(472)
Golfing	1430	1716	1870	2042	.000	-	1870	.000	-	2042
Tennis	-	-	-	-	.020	5873	(5873)	.030	9982	(9982)
Special Event										
- Spect.	-	-	-	-	.010	2936	(2936)	.020	6655	(6655)
- Part.	1815	2178	2374	2592	.010	2936	(562)	.010	3327	(735)
Waterfowl hunt.	-	-	-	-	.000	-	-	-	-	-
All other hunt.	-	-	-	-	.000	-	-	-	-	-
TOTALS	165550	198660	216539	236405	.821	241075	(24535)	.852	283485	(47077)
Activity Days per										
Visitor Day	.778	.778	.778	.778	.821	.821		.852	.852	
VISITOR DAYS	212795	255347	278328	303862	293636	293636		332729	332729	

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY
FACTORS 1975, 1980 - AREA 2

1. A small adjustment is made to swimming activity in 1980 to reflect limitation of good available resource.
2. A slight increase is given to activity of fishing by boat in 1975 to reflect improved boat docking and launching facilities.
3. A slight decrease is given to activity of fishing - no boat, to reflect excessive use of pier facilities.
4. Motor boating activity is increased to reflect more adequate launching and docking facilities.
5. Sailing activity is increased to reflect further expansion of boating facilities.
6. Canoeing activity is increased to reflect use somewhat similar to that in Area 1.
7. Water skiing activity is increased in conjunction with boating activity.
8. Special events, both spectator and participant, are increased in 1975 and 1980 to reflect more organized sporting activity in the area.

AREA 3

GRAND BEACH - GRAND MARAIS

TABLE 3A

GRAND BLACH PROVINCIAL PARK VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

Average Stay Per Trip - 1.91 days					
Weekends - 1.34 days					
Weekdays - .57 days					
TOTAL NUMBER TRIPS - 324548					
Number Visitor Days					
Accommodation Type		Metro Residents	Other	Total	Per Cent
Motel	1842 x 2.58	4752	950	5702	.8%
Cottage	45680 x 2.58	117854	23570	141424	19.0
Camping	101306 x 2.58	261369	52274	313643	42.2
Friends and Relatives	37944 x 2.58	98136	19627	117763	15.8
Day Visits	<u>137776</u> x 1.0	<u>137776</u>	<u>27555</u>	<u>165331</u>	<u>22.2</u>
TOTALS	324548 x 1.91	619887	123976	743863	100.0
Exclusive of Day Visits - Average Stay = 2.58 Days					
Per Cent Weekend Use = 70.2%					

PER CENT VISITOR DAYS BY AGE GROUP

Age	Per Cent
0 - 4	6.8%
5 - 9	10.0
10 - 15	6.7
16 - 17	5.2
18 - 19	6.5
20 - 24	21.7
25 - 34	18.3
35 - 44	9.4
45 - 54	11.3
55 - 64	3.2
65 - 69	0.2
70 plus	0.7

TABLE 3B

GRAND BEACH - GRAND MARAIS
ACTIVITY PARTICIPATION, 1971

Summer Activity	Activity Days			Supply
	Metro Residents	Per Cent	Per Visitor Day	
Swimming	458260	58.0%	.739	1 Class 1 1 Class 3
Fishing - boat	13970	1.8	.023	Lagoon
Fishing - no boat	58905	7.5	.095	Boat ramp - lagoon
Motor boating	23155	2.9	.037	Boat ramp - lagoon
Sailing	715	.1	.001	
Canoeing	1815	.2	.003	
Other boating	8800	1.1	.014	
Water skiing	12485	1.6	.020	
Picnicing	203335	25.7	.328	Provincial park
Horseback riding	715	.1	.001	
Golfing	1430	.2	.002	Driving range
Tennis	715	.1	.001	
Special events				
- Spectator	1430	.2	.002	
- Participant	2200	.3	.004	
Waterfowl hunting	715	.1	.001	No actual hunting in beach area
All other hunting	715	.1	.001	
TOTALS	789360	100.0	1.273	

Number of activity days per visitor day

$$= \frac{789360}{619887} = 1.273$$

TABLE 3C
PROJECTED DEMAND 1975 AND 1980 (SUMMER) - GRAND BEACH

Activity	Metro (1)	Total (2)	1975 (3)	1980 (4)	Adjusted A.F. 1975 (5)	Adjusted Activity Days 1975 (6)	Excess Demand 1975 (7)	Adjusted A.F. 1980 (8)	Adjusted Activity Days 1980 (9)	Excess Demand 1980 (10)
Swimming	458260	549912	599404	654395	.665	505377	94027	.630	508757	145638
Fishing										
- boat	13970	16764	18273	19949	.020	15199	3074	.018	14536	5413
- no boat	58905	70686	77048	84116	.095	72197	4851	.095	76717	7399
Motor boating	23155	27786	30287	33065	.037	28119	2168	.035	28264	4801
Sailing	715	858	935	1021	.002	1520	(585)	.003	2423	(1402)
Canoeing	1815	2178	2374	2592	.004	3040	(666)	.004	3230	(638)
Other boating	8800	10560	11510	12566	.012	9120	2390	.012	9691	2875
Water skiing	12485	14982	16330	17829	.020	15199	1131	.020	16151	1678
Picnicing	203335	244002	265962	290362	.325	246989	18973	.315	254378	35984
Horseback riding	715	858	935	1021	.003	2280	(1345)	.003	2423	(1402)
Golfing	1430	1716	1870	2042	.002	1520	350	.015	12113	(10071)
Tennis	715	858	935	1021	.002	1520	(585)	.005	4038	(3017)
Special Event										
- Spect.	1430	1716	1870	2042	.002	1520	350	.002	1615	427
- Part.	2200	2640	2878	3142	.004	3040	(162)	.004	3230	(68)
Waterfowl hunt.	715	858	935	1021	.000	-	935	.000	-	1021
All other hunt.	715	858	935	1021	.000	-	935	.000	-	1021
TOTALS	789360	947232	1032433	1127206	1.193	906639	125841	1.161	937566	189639
Activity Days per										
Visitor Day	1.273	1.273	1.273	1.273	1.193	1.193		1.161	1.161	
VISITOR DAYS	619887	744094	811063	885472	759966	759966		807550	807550	

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY

FACTORS 1975, 1980 - AREA 3

1. Reduction in swimming participation factor as a result of limited beach resource.
2. Boating activities of all types are altered to reflect overcrowding of lagoon area and subsequent restrictions on motor craft with appropriate preference to sailboats and canoes.
3. Reduction in picnicing activity factor to reflect limitation of entire area to support further extensive use. This is very much a day use activity and alternative locations are numerous.
4. Golfing activity increased in 1980 to reflect completion of 18-hole course.

AREA 4

ST. CLEMENTS

TABLE 4A

ST. CLEMENTS VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

Average Stay Per Trip	-	1.72 days
Weekends	-	1.55 days
Weekdays	-	.17 days
TOTAL NUMBER TRIPS	-	65941

Accommodation Type	Number Visitor Days				Per Cent
		Metro Residents	Other	Total	
Hotel	1474 x 2.05	3022	604	3626	2.7%
Cottage	40154 x 2.05	82316	16463	98779	72.6
Friends and Relatives	3315 x 2.05	7082	1416	8498	6.2
Day Visits	<u>20998</u> x 1.0	<u>20998</u>	<u>4199</u>	<u>25197</u>	<u>18.5</u>
TOTALS	65941 x 1.72	113418	22682	136100	100.0

Exclusive of Day Visits - Average Stay = 2.05 Days
Per Cent Weekend Use = 90.1%

PER CENT VISITOR DAYS BY AGE GROUP

<u>Age</u>	<u>Per Cent</u>
0 - 4	9.7%
5 - 9	13.3
10 - 15	1.0
16 - 17	0.3
18 - 19	3.0
20 - 24	6.8
25 - 34	12.3
35 - 44	14.0
45 - 54	14.3
55 - 64	12.3
65 - 69	0.0
70 plus	13.0

TABLE 4B
ST. CLEMENTS
ACTIVITY PARTICIPATION, 1971

Summer Activity	Activity Days			Supply
	Metro Residents	Per Cent	Per Visitor Day	
Swimming	47850	53.8%	.422	1 Class 1 4 Class 3
Fishing - boat	6215	6.9	.055	
Fishing - no boat	4400	4.9	.039	
Motor boating	330	.4	.003	
Sailing	330	.4	.003	
Canoeing	-	-	-	
Other boating	-	-	-	
Water skiing	2200	2.5	.019	
Picnicing	27610	31.1	.243	Prov. rec. area
Horseback riding	-	-	-	
Golfing	-	-	-	
Tennis	-	-	-	
Special events				
- Spectator	-	-	-	
- Participant	-	-	-	
Waterfowl hunting	-	-	-	
All other hunting	-	-	-	
TOTALS	88935	100.0	.784	

Number of activity days per visitor day

$$= \frac{88935}{113418} = .784$$

TABLE 4C

PROJECTED DEMAND 1975 AND 1980 (SUNNER) - ST. CLEMENTS

Activity	Metro (1)	Total (2)	1975 (3)	1980 (4)	Adjusted A.F.		Adjusted Activity Days 1975 (6)	Excess Demand		Adjusted Activity Days 1980 (9)	Excess Demand	
					1975 (5)	1980 (8)		1975 (7)	1980 (10)		1975 (11)	1980 (12)
Swimming	47850	57420	62587	68330	.422	.422	65182	(2595)	.422	75059	(6729)	
Fishing												
- boat	6215	7458	8129	8875	.055	.055	8495	(366)	.055	9783	(908)	
- no boat	4400	5280	5755	6283	.040	.040	6178	(423)	.045	8004	(1721)	
Motor boating	330	396	432	471	.010	.010	1545	(1113)	.015	2668	(2197)	
Sailing	330	396	432	471	.005	.005	772	(340)	.005	889	(418)	
Canoeing	-	-	-	-	.002	.002	309	(309)	.002	356	(356)	
Other boating	-	-	-	-	.002	.002	309	(309)	.002	356	(356)	
Water skiing	2200	2640	2878	3142	.020	.020	3089	(211)	.020	3557	(415)	
Picnicing	27610	33132	36113	39427	.250	.250	38615	(2502)	.275	48913	(9486)	
Horseback riding	-	-	-	-	.005	.005	772	(772)	.005	889	(889)	
Golfing	-	-	-	-	.000	.000	-	-	.000	-	-	
Tennis	-	-	-	-	.000	.000	-	-	.010	1779	(1779)	
Special Event												
- Spect.	-	-	-	-	.002	.002	309	(309)	.002	356	(356)	
- Part	-	-	-	-	.002	.002	309	(309)	.002	356	(356)	
Waterfowl hunt.	-	-	-	-	.001	.001	154	(154)	.001	177	(177)	
All other hunt.	-	-	-	-	.000	.000	-	-	.000	-	-	
TOTALS	88935	106722	116327	126999	.816	.861	126038	(9711)	.861	153141	(26142)	
Activity Days per												
Visitor Day	.784	.784	.784	.784	.816	.861	.816		.861	.861		
VISITOR DAYS	113418	136125	148376	161989	154459	177864	154459		177864	177864		

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY
FACTORS 1975, 1980 - AREA 4

1. Activity of fishing - no boat, increased to project future improvements in pier facilities in this area.
2. Motor boating activity increased in conjunction with improved launching and docking facilities.
3. Remaining boating activities increased to reflect similar increases in quantity and quality of docking and launching facilities.
4. Picnicing activity increased to reflect popularity of this area for day visit and picnic use. Popularity is directly related to proximity to population centres.
5. Remaining activity factors increased to reflect additional resources to carry out these activities. The provision of horses and the organization of activities is a minor adjustment.

AREA 5

ST. ALDREWS

TABLE 5A

ST. ANDREWS VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

Average Stay Per Trip		-	2.60 days		
Weekends		-	1.64 days		
Weekdays		-	.96 days		
TOTAL NUMBER TRIPS		-	222136		

Accommodation Type		Number Visitor Days			
		Metro Residents	Other	Total	Per Cent
Cottage	115304 x 3.10	358595	71719	430314	62.1%
Camping	21366 x 3.10	66448	13289	79737	11.5
Friends and Relatives	32050 x 3.10	99095	19819	118914	17.2
Day Visits	<u>53416</u> x 1.0	<u>53416</u>	<u>10683</u>	<u>64099</u>	<u>9.2</u>
TOTALS	222136 x 2.60	577554	115510	693064	100.0

Exclusive of Day Visits - Average Stay = 3.10 Days
Per Cent Weekend Use = 63.1%

PER CENT VISITOR DAYS BY AGE GROUP

Age	Per Cent
0 - 4	4.5%
5 - 9	6.9
10 - 15	12.6
16 - 17	14.0
18 - 19	6.9
20 - 24	3.1
25 - 34	13.1
35 - 44	11.4
45 - 54	15.3
55 - 64	11.8
65 - 69	0.3
70 plus	0.1

TABLE 5B
ST. ANDREWS
ACTIVITY PARTICIPATION, 1971

Summer Activity	Activity Days			Supply
	Metro Residents	Per Cent	Per Visitor Day	
Swimming	234245	50.2%	.406	2 Class 1 4 Class 3
Fishing - boat	18755	4.0	.032	Boat ramp, pier, harbor
Fishing - no boat	58905	12.6	.102	Pier
Motor boating	20625	4.4	.036	
Sailing	715	.2	.001	
Canoeing	8085	1.7	.014	
Other boating	-	-	-	
Water skiing	7700	1.7	.013	
Picnicing	90970	19.5	.158	Prov. rec. area
Horseback riding	2200	.5	.004	Stable
Golfing	13970	3.0	.024	9-hole course
Tennis	4785	1.0	.008	Tennis courts
Special events				
- Spectator	4785	1.0	.008	
- Participant	-	-	-	
Waterfowl hunting	-	-	-	
All other hunting	715	.2	.001	
TOTALS	466455	100.0	.807	

Number of activity days per visitor day

$$= \frac{466455}{577554} = .807$$

TABLE 5C
PROJECTED DEMAND 1975 AND 1980 (SUMMER) - ST. ANDREWS

Activity	Metro (1)	Total (2)	1975 (3)	1980 (4)	Adjusted		Excess Demand 1975 (7)	Adjusted		Excess Demand 1980 (10)
					A.F. 1975 (5)	Days 1975 (6)		A.F. 1980 (8)	Days 1980 (9)	
Swimming	234245	281094	306392	334502	.360	264009	42383	.360	287338	47164
Fishing										
- boat	18755	22506	24532	26782	.032	23467	1065	.032	25541	1241
- no boat	58905	70686	77048	84116	.102	74802	2246	.102	81413	2703
Motor boating	20625	24750	26998	29453	.036	26401	597	.036	28734	719
Sailing	715	858	935	1021	.002	1467	(532)	.003	2394	(1373)
Canoeing	8085	9702	10575	11545	.014	10227	348	.014	11174	371
Other boating	-	-	-	-	.010	7334	(7334)	.010	7982	(7982)
Water skiing	7700	9240	10072	10996	.015	11000	(928)	.015	11972	(976)
Picnicing	90970	109164	118989	129905	.165	121004	(2015)	.165	131679	(1774)
Horseback riding	2200	2640	2878	3142	.005	3667	(789)	.005	3991	(849)
Golfing	13970	16764	18273	19949	.020	14667	3606	.018	14367	5582
Tennis	4785	5742	6259	6833	.010	7333	(1074)	.010	7982	(1149)
Special Event										
- Spect.	4785	5742	6259	6833	.008	5867	392	.006	4781	2052
- Part.	-	-	-	-	.002	1467	(1467)	.002	1596	(1596)
Waterfowl hunt.	-	-	-	-	.001	733	(733)	.001	798	(798)
All other hunt.	745	894	974	1064	.001	733	241	.001	798	266
TOTALS	466455	559746	610123	666098	.783	574219	36006	.780	622566	43601
Activity Days										
per										
Visitor Day	.807	.807	.807	.807	.783	.783		.780	.780	
VISITOR DAYS	577554	693613	756038	825400	733357	733357	798162	798162	798162	

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY

FACTORS 1975, 1980 - AREA 5

1. Swimming activity adjustment made to reflect limitation of beach resource.
2. Minor adjustment to specific boating activity in accordance with popularity and improved facilities, especially those at Winnipeg Beach.
3. Picnicing activity participation factor increased to reflect recent completion of provincial recreation area at Winnipeg Beach.
4. Adjustment made to golfing activity factor to reflect limitation of this resource.

AREA 6

GIMLI

TABLE 6A

GIMLI VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

Average Stay Per Trip - 2.92 days					
Weekends - 1.96 days					
Weekdays - .96 days					
TOTAL NUMBER TRIPS - 150670					
Accommodation Type		Number Visitor Days			Per Cent
		Metro Residents	Other	Total	
Motel	368 x 2.92	1075	215	1290	.2%
Cottage	67415 x 2.92	196852	39370	236222	44.7
Camping	9947 x 2.92	29045	5809	34854	6.7
Friends and Relatives	25787 x 2.92	165831	33166	198997	37.7
Day Visits	<u>47153</u> x 1.0	<u>47153</u>	<u>9430</u>	<u>56583</u>	<u>10.7</u>
TOTALS	150670 x 2.92	439956	87990	527946	100.0
Exclusive of Day Visits - Average Stay = 3.79 Days					
Per Cent Weekend Use = 67.1%					

PER CENT VISITOR DAYS BY AGE GROUP

<u>Age</u>	<u>Per Cent</u>
0 - 4	3.6%
5 - 9	10.1
10 - 15	14.0
16 - 17	9.6
18 - 19	2.6
20 - 24	5.6
25 - 34	7.5
35 - 44	13.6
45 - 54	22.7
55 - 64	5.9
65 - 69	1.2
70 plus	3.6

TABLE 6B
GIMLI
ACTIVITY PARTICIPATION, 1971

Summer Activity	Activity Days			Supply
	Metro Residents	Per Cent	Per Visitor Day	
Swimming	210705	56.6%	.479	6 Class 1 9 Class 3
Fishing - boat	4785	1.3	.011	Pier; manmade harbor
Fishing - no boat	26840	7.2	.061	Pier
Motor boating	11000	2.9	.025	
Sailing	4400	1.2	.010	
Canoeing	-	-	-	
Other boating	5500	1.5	.013	
Water skiing	1430	.4	.003	
Picnicing	57805	15.5	.131	
Horseback riding	10670	2.9	.024	Riding stables
Golfing	24640	6.5	.056	2 golf courses
Tennis	5500	1.5	.013	Tennis courts
Special events				
- Spectator	1815	.5	.004	
- Participant	7315	2.0	.017	Govt. training centre
Waterfowl hunting	-	-	-	
All other hunting	-	-	-	
TOTALS	372405	100.0	.847	

Number of activity days per visitor day

$$= \frac{372405}{439956} = .847$$

TABLE 6C

PROJECTED DEMAND 1975 AND 1980 (SUMMER) - GIMLI

Activity	Metro (1)	Total (2)	1975 (3)	1980 (4)	Adjusted		Adjusted		Adjusted		Adjusted	
					A.F. 1975 (5)	Days 1975 (6)	Excess Demand 1975 (7)	A.F. 1980 (8)	Days 1980 (9)	Excess Demand 1980 (10)	A.F. 1980 (8)	Days 1980 (9)
Swimming	210705	252846	275602	300887	.470	272186	3416	.470	296508	4397		
Fishing												
- boat	4785	5742	6259	6833	.011	6370	(111)	.011	6940	(107)		
- no boat	26840	32208	35107	38328	.060	34747	360	.060	37852	476		
Motor boating	11000	13200	14388	15708	.030	17374	(2989)	.030	18926	(3218)		
Sailing	4400	5280	5755	6283	.015	8687	(2932)	.015	9463	(3180)		
Canoeing	-	-	-	-	.010	5791	(5791)	.010	6309	(6309)		
Other boating	5500	6600	7194	7854	.013	7529	(335)	.013	8201	(347)		
Water skiing	1430	1716	1870	2042	.005	2896	(1026)	.008	5047	(3005)		
Picnicing	57805	69366	75609	82546	.135	78181	(2572)	.135	85167	(2621)		
Horseback riding	10670	12804	13956	15237	.020	11582	2374	.020	12617	2620		
Golfing	24640	29568	32229	35186	.050	28956	3273	.045	28389	6797		
Tennis	5500	6600	7194	7854	.013	7529	(335)	.010	6309	1545		
Special Event												
- Spect.	1815	2178	2374	2592	.004	2316	58	.004	2523	69		
- Part.	7315	8778	9568	10446	.018	10424	(856)	.018	11356	(910)		
Waterfowl hunt.	-	-	-	-	.001	579	579	.001	631	(631)		
All other hunt.	-	-	-	-	.001	579	579	.001	631	(631)		
TOTALS	372405	446886	487105	531794	.856	495951	(8846)	.851	536807	(5013)		
Activity Days												
per												
Visitor Day	.847	.847	.847	.847	.856	.856		.851	.851			
VISITOR DAYS	439956	527610	575094	627856	581420	581420	630870	630870	630870			

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY

FACTORS 1975, 1980 - AREA 6

1. Slight adjustment in swimming activity participation factor in 1975 to reflect the limitation of beach resource within area.
2. Small reduction in fishing - no boat activity factor to reflect limitation of pier facilities.
3. Increase in boating participation factor to reflect popularity of activity and improved boating facilities.
4. Slight increases in other boating categories such as sailing, canoeing, etc. to also reflect increases in demands for this type of activity and improved facilities.
5. Slight increase in picnicing participation factor in 1975 to reflect recent developments within Gimli area. These developments should improve day use facilities.
6. Decrease in golfing activity factor to reflect the limitation of this resource.
7. Slight decrease in tennis activity factor in 1980 to reflect the decrease in this resource.
8. Small increases in both hunting activity factors to reflect more realistic condition. The sample produced no activity days in either but this is no doubt a result of sampling error.

AREA 7

BIFROST

TABLE 7A

BIFROST VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

Average Stay Per Trip - 2.15 days					
Weekends - 1.34 days					
Weekdays - .81 days					
TOTAL NUMBER TRIPS - 9578					
Accommodation Type		Number Visitor Days			
		Metro Residents	Other	Total	Per Cent
Cottage	2579 x 2.57	6628	1325	7953	32.2%
Camping	3683 x 2.57	9465	1893	11358	45.9
Friends and Relatives	737 x 2.57	1921	384	2305	9.4
Day Visits	<u>2579</u> x 1.0	<u>2579</u>	<u>516</u>	<u>3095</u>	<u>12.5</u>
TOTALS	9578 x 2.15	20593	4118	24711	100.0
Exclusive of Day Visits - Average Stay = 2.57 Days					
Per Cent Weekend Use = 62.3%					

PER CENT VISITOR DAYS BY AGE GROUP

Age	Per Cent
0 - 4	0.0%
5 - 9	12.5
10 - 15	19.6
16 - 17	8.9
18 - 19	3.6
20 - 24	0.0
25 - 34	1.9
35 - 44	8.9
45 - 54	27.5
55 - 64	7.1
65 - 69	0.0
70 plus	0.0

TABLE 7B
BIFROST
ACTIVITY PARTICIPATION, 1971

Summer Activity	Activity Days			Supply
	Metro Residents	Per Cent	Per Visitor Day	
Swimming	10285	27.3%	.499	1 Class 1, 2 Class 3
Fishing - boat	-	-	-	
Fishing - no boat	8085	21.4	.393	Pier
Motor boating	715	1.9	.035	
Sailing	-	-	-	
Canoeing	-	-	-	
Other boating	330	.9	.016	
Water skiing	-	-	-	
Picnicing	15455	40.9	.750	Prov.rec.area
Horseback riding	-	-	-	
Golfing	-	-	-	
Tennis	715	1.9	.035	
Special events				
- Spectator	-	-	-	
- Participant	1430	3.8	.069	
Waterfowl hunting	715	1.9	.035	Marsh - Riverton
All other hunting	-	-	-	
TOTALS	37730	100.0	1.832	

Number of activity days per visitor day

$$= \frac{37730}{20593} = 1.832$$

TABLE 7C
PROJECTED DEMAND 1975 AND 1980 (SUMMER) - BIFROST

Activity	Metro (1)	Total (2)	1975 (3)	1980 (4)	Adjusted A.F. 1975 (5)	Adjusted Activity Days 1975 (6)	Excess Demand 1975 (7)	Adjusted A.F. 1980 (8)	Adjusted Activity Days 1980 (9)	Excess Demand 1980 (10)
Swimming	10285	12342	13453	14687	.550	14961	(1508)	.550	16749	(2062)
Fishing	-	-	-	-	-	-	-	-	-	-
- boat	-	-	-	-	.005	136	(136)	.010	305	(305)
- no boat	8085	9702	10575	11545	.350	9521	1054	.350	10659	886
Motor boating	715	858	935	1021	.035	952	(17)	.035	1066	(45)
Sailing	-	-	-	-	.001	27	(27)	.005	152	(152)
Canoeing	-	-	-	-	.001	27	(27)	.010	305	(305)
Other boating	330	396	432	471	.016	435	131	.020	609	(138)
Water skiing	-	-	-	-	.005	136	(136)	.010	305	(305)
Picnicing	15455	18546	20215	22070	.750	20402	(187)	.750	22840	(770)
Horseback riding	-	-	-	-	.001	27	(27)	.002	61	(61)
Golfing	-	-	-	-	.000	-	-	.000	-	-
Tennis	715	858	935	1021	.035	952	(17)	.040	1218	(197)
Special Event	-	-	-	-	-	-	-	-	-	-
- Spect.	-	-	-	-	.001	27	(27)	.005	152	(152)
- Part.	1430	1716	1870	2042	.065	1768	102	.065	1979	63
Waterfowl hunt.	715	858	935	1021	.035	952	(17)	.035	1066	(45)
All other hunt.	-	-	-	-	.000	0	0	.010	305	(305)
TOTALS	37730	45276	49351	53878	1.850	50324	(973)	1.897	57769	(3893)
Activity Days per										
Visitor Day	1.832	1.832	1.832	1.832	1.850	1.850		1.897	1.897	
VISITOR DAYS	20593	24714	26938	29409	27202	27202		30453	30453	

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY

FACTORS 1975, 1980 - AREA 7

1. Increases in swimming activity participation factor to reflect improvements in beach facilities and development of new facilities.
2. Increases in the fishing - boat activity factor, to reflect improvements in launching and docking facilities.
3. Decreases in fishing - no boat activity factor, to reflect overuse of facilities which will naturally result with increased visitor use. This factor is still much higher than average only because total visitor use is still somewhat small.
4. Increases in motor boat and sailing activity factors to reflect increases in launching and docking facilities and general increases in overall use.
5. Increase in water skiing activity factor to coincide with increase in boating activity factor.
6. Increase in tennis activity factor in 1980 to reflect increase in quantity and quality of facility.

AREA 8

FISHER

TABLE 8A
FISHER VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

No trips taken to this area in the survey.

TABLE 8B
FISHER
ACTIVITY PARTICIPATION, 1971

- Nil -

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY

FACTORS 1975, 1980 - AREA 8

The survey did not reveal any visitation to this area in the summer of 1971 and therefore projections are not feasible. There will no doubt be visitation to this area by 1975 and assuredly by 1980 but this is not reflected in 1971 use patterns. The use will, in fact, rise out of excess demand being unsatisfied in other areas. This will be discussed further at the end of this report.

AREA 9

HECLA ISLAND AND GRINDSTONE POINT

TABLE 9A

HECLA VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

Average Stay Per Trip - 1.83 days
Weekends - 1.69 days
Weekdays - .14 days
TOTAL NUMBER TRIPS - 10683

Accommodation Type		Number Visitor Days			Per Cent
		Metro Residents	Other	Total	
Motel	1105 x 2.20	2431	486	2917	12.4%
Lodge	368 x 2.20	810	162	972	4.1
Cottage	1474 x 2.20	3243	649	3892	16.6
Friends and Relatives	4421 x 2.20	9751	1950	11701	49.9
Day Visits	<u>3315</u> x 1.0	<u>3315</u>	<u>663</u>	<u>3978</u>	<u>17.0</u>
TOTALS	10683 x 1.83	19550	3910	23460	100.0

Exclusive of Day Visits - Average Stay = 2.20 Days
Per Cent Weekend Use = 92.4%

PER CENT VISITOR DAYS BY AGE GROUP

Age	Per Cent
0 - 4	0.0%
5 - 9	0.0
10 - 15	7.5
16 - 17	0.0
18 - 19	0.0
20 - 24	3.8
25 - 34	45.3
35 - 44	0.0
45 - 54	11.3
55 - 64	30.2
65 - 69	1.9
70 plus	0.0

TABLE 9B
 NECLA ISLAND AND GRINDSTONE POINT
 ACTIVITY PARTICIPATION, 1971

Summer Activity	Activity Days			Supply
	Metro Residents	Per Cent	Per Visitor Day	
Swimming	8085	26.1%	.414	4 Class 1, 11 Class 3
Fishing - boat	3300	10.6	.169	Natural harbor, pier
Fishing - no boat	2915	9.4	.149	
Motor boating	2530	8.1	.129	
Sailing	-	-	-	
Canoeing	4785	15.4	.245	
Other boating	-	-	-	
Water skiing	1815	5.8	.093	
Picnicing	5115	16.5	.262	Provincial park
Horseback riding	-	-	-	
Golfing	-	-	-	
Tennis	715	2.3	.037	
Special events				
- Spectator	715	2.3	.037	
- Participant	-	-	-	
Waterfowl hunting	1100	3.5	.056	Marshes
All other hunting	-	-	-	
TOTALS	31075	100.0	1.589	

Number of activity days per visitor day

$$= \frac{31075}{19550} = 1.589$$

TABLE 9C

PROJECTED DEMAND 1975 AND 1980 (SUMMER) - HECLA ISLAND AND GRINDSTONE POINT

Activity	Metro (1)	Total (2)	1975 (3)	1980 (4)	Adjusted A.F.		Adjusted Activity Days 1975 (6)	Excess Demand 1975 (7)	Adjusted A.F.		Adjusted Activity Days 1980 (9)	Excess Demand 1980 (10)
					1975 (5)	1980 (8)			1975 (8)	1980 (10)		
Swimming	8085	9702	10575	11545	.450	.500	12930	(2355)	.500	16125	(4580)	
Fishing												
- boat	3300	3960	4316	4712	.170	.170	4885	(569)	.170	5482	(770)	
- no boat	2915	3498	3813	4163	.150	.150	4310	(497)	.150	4837	(674)	
Motor boating	2530	3036	3309	3613	.140	.140	4023	(714)	.140	4515	(902)	
Sailing	-	-	-	-	.010	.010	287	(287)	.010	322	(322)	
Canoeing	4785	5742	6259	6833	.250	.250	7184	(925)	.250	8062	(1229)	
Other boating	-	-	-	-	.010	.010	287	(284)	.010	322	(322)	
Water skiing	1815	2178	2374	2592	.095	.095	2730	(356)	.095	3064	(472)	
Picnicing	5115	6138	6690	7304	.300	.300	8620	(1930)	.300	9675	(2371)	
Horseback riding	-	-	-	-	.010	.010	287	(287)	.010	322	(322)	
Golfing	-	-	-	-	.040	.040	1149	(1149)	.040	1290	(1290)	
Tennis	715	858	935	1021	.040	.040	1149	(214)	.040	1290	(269)	
Special Event												
- Spect.	715	858	935	1021	.040	.040	1149	(214)	.040	1290	(269)	
- Part.	-	-	-	-	.010	.010	287	(287)	.010	322	(322)	
Waterfowl hunt.	1100	1320	1439	1571	.060	.060	1724	(285)	.060	1935	(364)	
All other hunt.	-	-	-	-	.010	.010	287	(287)	.010	322	(322)	
TOTALS	31075	37290	40646	44375	1.785	1.835	48991	(8345)	1.835	59177	(14802)	
Activity Days per												
Visitor Day	1.589	1.589	1.589	1.589	1.785	1.835	1.785		1.835	1.835		
VISITOR DAYS	19550	23468	25580	27926	28734	32249	28734		32249	32249		

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY

FACTORS 1975, 1980 - AREA 9

1. Swimming activity participation factor increased in 1975 and 1980 to reflect further developments of this area as a new provincial park.
2. All boating activity participation factors have been increased to reflect additions and improvements in launching and docking facilities.
3. Increase in picnicing activity participation factor to reflect further development of Hecla Island as a provincial park.
4. Increases in horseback riding and golfing activity participation factors to reflect further development of these activities. There is a proposed 18-hole golf course for the Hecla Island area.
5. Slight increases in remaining activity participation factors reflect improved access, development, and increased use of the area.

AREA 10

ALL OTHER AREAS

TABLE 10A

ALL OTHER AREAS VISITOR USE
MAY 1 - SEPTEMBER 30, 1971

Average Stay Per Trip	-	1.19 days
Weekends	-	.94 days
Weekdays	-	.25 days
TOTAL NUMBER TRIPS	-	5894

		<u>Number Visitor Days</u>			
<u>Accommodation Type</u>		<u>Metro Residents</u>	<u>Other</u>	<u>Total</u>	<u>Per Cent</u>
Day Visits	5894 x 1.19	7014	1403	8417	100.0%
Per Cent Weekend Use = 79.0%					

PER CENT VISITOR DAYS BY AGE GROUP

<u>Age</u>	<u>Per Cent</u>
0 - 4	10.5%
5 - 9	10.5
10 - 15	0.0
16 - 17	0.0
18 - 19	0.0
20 - 24	10.5
25 - 34	21.1
35 - 44	0.0
45 - 54	26.3
55 - 64	21.1
65 - 69	0.0
70 plus	0.0

TABLE 10B
ALL OTHER AREAS
ACTIVITY PARTICIPATION, 1971

Summer Activity	Activity Days			Supply
	Metro Residents	Per Cent	Per Visitor Day	
Swimming	1815	25.0%	.259	
Fishing - boat	-	-	-	
Fishing - no boat	-	-	-	
Motor boating	-	-	-	
Sailing	-	-	-	
Canoeing	-	-	-	
Other boating	1430	19.7	.204	Cruises
Water skiing	-	-	-	
Picnicing	4015	55.8	.572	
Horseback riding	-	-	-	
Golfing	-	-	-	
Tennis	-	-	-	
Special events				
- Spectator	-	-	-	
- Participant	-	-	-	
Waterfowl hunting	-	-	-	
All other hunting	-	-	-	
TOTALS	7250	100.0	1.035	

Number of activity days per visitor day

$$= \frac{7260}{7014} = 1.035$$

TABLE 10C
PROJECTED DEMAND 1975 AND 1980 (SUMMER) - ALL OTHER AREAS

Activity	Metro (1)	Total (2)	1975 (3)	1980 (4)	Adjusted A.F. 1975 (5)	Adjusted Activity Days 1975 (6)	Excess Demand 1975 (7)	Adjusted A.F. 1980 (8)	Adjusted Activity Days 1980 (9)	Excess Demand 1980 (10)
Swimming	1815	2178	2374	2592	.300	3482	(1108)	.350	4820	(2228)
Fishing	-	-	-	-	-	-	-	-	-	-
- boat	-	-	-	-	.020	232	(232)	.025	344	(344)
- no boat	-	-	-	-	.040	464	(464)	.050	687	(687)
Motor boating	-	-	-	-	.060	696	(696)	.080	1102	(1102)
Sailing	-	-	-	-	.005	58	(58)	.010	138	(138)
Canoeing	-	-	-	-	.030	348	(348)	.030	413	(413)
Other boating	1430	1716	1870	2042	.215	2495	(453)	.230	3168	(1126)
Water skiing	-	-	-	-	.015	174	(174)	.020	275	(275)
Picnicing	4015	4818	5733	6259	.600	6964	(705)	.600	8263	(2004)
Horseback riding	-	-	-	-	.001	12	(12)	.005	69	(69)
Golfing	-	-	-	-	.000	-	-	.000	0	-
Tennis	-	-	-	-	.000	-	-	.000	-	-
Special Event	-	-	-	-	-	-	-	-	-	-
- Spect.	-	-	-	-	.005	58	(58)	.005	69	(69)
- Part.	-	-	-	-	.005	58	(58)	.005	69	(69)
Waterfowl hunt.	-	-	-	-	.005	58	(58)	.005	69	(69)
All other hunt.	-	-	-	-	.010	116	(116)	.010	138	(138)
TOTALS	7250	8700	9483	10353	1.311	15215	(5732)	1.425	19625	(9272)
Activity Days per										
Visitor Day	1.035	1.035	1.035	1.035	1.311	1.311		1.425	1.425	
VISITOR DAYS	7014	8406	9162	10003	11606	11606		13772	13772	

ASSUMPTIONS USED TO DETERMINE ADJUSTED ACTIVITY

FACTORS 1975, 1980 - AREA 10

1. Increase in swimming participation activity factor in 1975 and 1980 to reflect future development in these areas.
2. Increases in boating activity participation factors to reflect future development of launching and docking facilities and general increases in use of area.
3. Increases in picnicing activity participation factor to reflect future development of recreation areas in this region.
4. Increases in remaining participation factors to reflect general increase of use which results in diversification of activity and development of facilities to accommodate such.

CHAPTER V

SUMMARY AND CONCLUSIONS

As noted, the adjustments to various activity participation factors are based on particular assumptions. Whether or not these assumptions are entirely correct is not of prime importance. What is significant is that the format allows for variations in these assumptions. Regardless of what minor alterations are made to the majority of the activities, the data clearly accents the degree of dependency on swimming as the basis of all recreation use in the area.

The activity participation factor for swimming is approximately .5, or expressed in other terms: any person visiting the Lake Winnipeg Region will ideally want to participate in approximately 1.2 activities per day of visit but nearly one-half of these activities must be swimming.

Because of the significance of this factor and its dependency on beach resources, it is not difficult to imagine the impact on recreational demands if regulation of the lake damages the beach resources to any considerable extent. Table 6 illustrates this impact on the excess demands for 1975 and 1980.

In 1975 there will be a further demand for 178,729 activity days in the Lake Winnipeg Region. Of these 171,667 are swimming activity days. If the activity participation factor is approximately .5 then there will be a demand for 343,334 visitor days of recreation on Lake Winnipeg. The corresponding figure for 1980 is estimated at 447,512 visitor days. This will no doubt be satisfied in the less used areas such as Bifrost, Hecla

Table 6

SUMMARY OF EXCESS DEMANDS IN ACTIVITY DAYS

Area	Excess Demand in Activity Days		Activity Days per Visitor Day	
	1975	1980	1975	1980
Victoria Beach	75024	95154	1.040	1.023
Alexander	(24535)	(47077)	.821	.852
Grand Beach - Grand Marais	125841	189639	1.193	1.161
St. Clements	(9711)	(28142)	.816	.861
St. Andrews	36006	43601	.783	.780
Gimli	(8046)	(5013)	.856	.851
Bifrost	(973)	(3893)	1.850	1.897
Fisher	-	-	-	-
Hecla Island - Grindstone Point	(2345)	(14802)	1.785	1.835
All other areas	(5732)	(9272)	1.311	1.425
EXCESS DEMAND	178729	222195		

Island, etc.

However, if the regulation of the lake deteriorates the resource and affects the activity participation factor by reducing it to .45, then the required developments will have to accommodate 381,000 visitor days by 1975 and 490,000 by 1980. So in effect a 10 per cent deterioration in the quality or quantity of beaches as a result of regulation could create a need for additional facilities to accommodate 38,000 visitor days by 1975 and 43,000 by 1980. This does not even take into consideration the additional demands arising out of each area because of the alteration.

Of course, this cannot be assessed entirely until such time as the study of shoreline influence is completed and the full impact of regulation assessed. When this information is made available the demand information can be updated to accommodate the changes.

NOTE: A more detailed assessment of the relationship between the levels of Lake Winnipeg and the use of the recreation resource present there was submitted in a letter (September 24, 1974) to the Study Director, by Mr. Niel Nixon, Research and Planning Branch, Manitoba Department of Tourism, Recreation and Cultural Affairs. Refer to the attached letter.

ANNEX I

SCOPE AND METHODOLOGY OF THE SURVEY

1. The General Nature of the Sample Design

The primary goal in establishing an appropriate design for this particular survey was to discover that design which would produce the required degree of reliability at the overall lowest cost. The fact that resources for planning the survey, both financial and human, were limited, suggested the need for a design which could be easily implemented and controlled. Accordingly, to ensure reliability and quality control, a probability sample was used whereby all individuals in the population were assumed to have an equal chance of selection.

Probability samples have a strong argument in their favour: the reliability of an estimate provided by such a sample can be calculated mathematically and therefore the estimates may be relied upon with a known degree of confidence. Other types of non-probability samples require much more detailed analysis and in general it is difficult or impossible to estimate the value of population parameters.

A major constraint facing the sample design is that no similar study has been conducted, nor has a pilot study been undertaken. The normal procedure for conducting a survey requires that a pilot study be undertaken to test the survey questions and provide estimates of the variance of the results so that an appropriate sample size may be mathematically determined. Because a pilot study was out of the question, it would be impossible to accurately determine the required sample size for this particular survey.

2. Sample Size

According to sampling theory, the parameters required to determine an appropriate sample size when testing a population are estimates of the mean and variance of the population. The relevant variables are denoted as follows:

Sample Mean	= $\bar{x}$
Sample Variance	= s^2
K	= 1.96
Population Size	= N
Coefficient of Variation	= $v^2 = (s/\bar{x})$
Desired Accuracy or Precision	= D
Required Sample Size	= n

Thus, one is able to determine the required sample size according to the following formula if one has all the above input parameters available:

$$n = \frac{K^2 N v^2}{ND^2 + Kv^2}$$

The normal procedure is to conduct a pilot survey in which estimates of S and $\bar{x}$ are obtained. From this survey, the coefficient of variation v^2 is determined and thus, given the desired accuracy of the sample D, one is readily able to determine the required sample size, n.

Without a reasonable estimate of v^2 , it is impossible for one to utilize sampling theory in this survey. It was proposed that the survey be conducted utilizing a sample size determined by budget

constraints and subsequently calculate the sample mean and sample variance from the results of the study. Such estimates can then be utilized in conjunction with the sample size to determine if in fact the results have the desired degree of reliability. The method of selecting the sample, as discussed later, is such that a second representative sample may be drawn and the results added to the initial sample without introducing any serious sampling bias. Therefore, the only real risk is that the initial sample was larger than required. The risk is indeed minimal.

The Determined Sample Size

According to the 1971 Unicity List of Voters, there were 327,885 individuals eighteen years of age or over residing in Metropolitan Winnipeg. It was considered that, at a minimum, a sample of at least 1000 of these individuals would be required if any useful degree of reliability were to be obtained from the survey and some cost control maintained.

The method of obtaining the information was a one-time survey of these 1000 respondents. Information pertaining to both summer and winter activities was gathered at the same time, the recall period being October 1, 1970 to September 30, 1971. Although the sample appears to contain only those individuals eighteen years of age and over, it should be pointed out that inclusion of those under eighteen is achieved through a special sampling technique. This will be outlined in more detail later. It should suffice at this time to point out that this special sampling technique is only

as reliable as the initial sample of 1000 respondents. If this sample is, in fact, random and can produce reliable estimates, then the sample of those under eighteen will be bona fide.

3. Selection of Primary Respondents- 1000 Interviewees
18 Years of Age and Over

(a) Source of Respondents

It is always a very difficult and expensive task both to specify the sampling units and the population to be surveyed and to subsequently draw the sample from that population. Furthermore, when conducting a survey of a major geographical area such as the City of Winnipeg, it is a difficult task to maintain a current data file from which to draw the sample. People are constantly on the move, new households are being formed and old ones ceasing to exist.

It is impossible to utilize telephone directories as a source of potential respondents, as these are only prepared once a year and many residents do not have telephones. A similar problem is faced with trying to utilize public utilities lists such as hydro electricity, sewer or water.

Fortunately, a municipal election was held in the City of Winnipeg on October 6, 1971 and a List of Electors was prepared at that time. To be included in the List of Electors, an individual has to be a Canadian citizen eighteen years of age or over and must have resided in the city for at least six months prior to the election date. Therefore, the List of Electors was an ideal population from which to draw a sample: it was up to date, it excluded transients, and it was not limited to those individuals who owned property, had telephones, or subscribed to any other public service.

It was decided, therefore, that the List of Electors for the Unicity Election would be used to select the survey sample. The city was divided into fifty Wards and each Ward was composed of several polling subdivisions. In addition, each of the electors in a polling subdivision was numbered so that a mechanical selection of the sample respondents could readily be made. The only modifications necessary in this selection procedure were to include in the population those electors which had been added to the initial List of Electors and to exclude those which had been subsequently removed from the List.

(b) Proportional Sampling by Ward

As specified earlier, it was decided that the sample to be used for this survey would be a proportional sample based upon the distribution of the adult population within the City of Winnipeg. As shown in Annex II, the fifty Wards used in the 1971 Unicity Election have been arbitrarily numbered from 1 to 50 for the purpose of simplifying the selection procedure. The total population of electors, after adjustments, was 327,885. From this population, a sample of 1000 respondents was to be selected. Annex II shows the sample size to be allocated to each of the fifty wards.

(c) Subsidiary Sample for Replacements

As is always the case in surveys, it is imperative to plan for replacements of the original selected respondents. A secondary sample, independent of the first, needed to be drawn from the population. The distribution of this subsidiary sample was drawn via the same proportional distribution system adopted for the primary

sample. A subsidiary sample size of 200 was utilized but this proved to be somewhat inadequate, as some Wards generated extremely high refusal rates. This problem is expanded upon in a later section.

(d) Selection Methodology

Because the List of Electors could be readily translated into numerical listings and because the sample to be drawn was relatively large to consider a manual selection, a computer programme was written to perform all the selections automatically in such a manner that the composition of the total sample would be a proportionate distribution of the population among wards. In addition, the List of Electors contains a special listing of non-resident property owners. Since these property owners will either reside outside of the City of Winnipeg or will be otherwise included in the Voters List as resident property owners, they were excluded from the selection procedure.

The easiest way to explain the details of the selection procedure is to illustrate the method by using a sample ward: The Ward of Jefferson (No. 27) composes Polling Subdivisions 158 to 162 inclusive. Table 1 illustrates the exact compositions of the voting population in this ward. Within the five polling subdivisions, there were actually 5,650 eligible voters. However, 11 of these were non-resident owners and thus the subpopulation from which the sample was to be drawn was 5,639. The raw data contained in Columns 1 to 5 were developed for each of the wards in the City of Winnipeg and utilized in the computer programme. For each ward, the total number

TABLE 1
EXPLANATION OF SELECTED METHODOLOGY FOR ONE WARD*

Polling Sub- division Number	Initial List	Non- Resident Owners	Struck Off List	Add To List	Total	Cumula- tive Total	Total Excluding Non- Residents
(1)	(2)	(3)	(4)	(5)			
158	1,224	1	2	2	1,225	1,225	1,224
159	1,067		4	1	1,064	2,289	1,064
160	1,404	2	5	3	1,404	3,693	1,402
161	828	8	1	1	836	4,529	828
162	1,123		4	2	1,121	5,650	1,121
TOTAL EXCLUDING NON-RESIDENTS							5,639

*Ward: Jefferson (No. 27)
Sample Size: 20

of voters exclusive of non-residents was calculated. The figures are shown in Annex II. The total of all ward populations was calculated as 327,885. The sample to be drawn from this population was 1000 and therefore, using this ratio of sample to population, the sample to be drawn from the population of Jefferson is calculated to be 20. (1000 divided by 327,885 equals 20 divided by 5,639, rounding off to the nearest whole number).

The computer programme written to select the respondent numbers was relatively straightforward, but it had to be written in such a way that all non-resident owners were to be excluded from the selection procedure. Fortunately, these non-resident owners were all grouped at the end of each Polling Subdivision List of Electors and therefore could be readily identified.

For the sake of administrative convenience, the programme selected all respondents at random in each ward and then grouped the selected respondents in numerical order according to the appropriate Polling Subdivisions within the Ward. This technique minimized searching through the List of Electors for names and addresses of the selected respondents.

The subsidiary or secondary sample of 200 respondents was generated at the same time. As replacement respondents were required they were drawn at random from the appropriate wards.

The last stage of the actual selection of the primary sample was to search the List of Electors for the names and addresses of those who had been selected and to punch these on

computer cards to produce two sets of labels: one for an initial mailing informing the selected respondents of the survey and the other for placement on the appropriately numbered questionnaire.

(e) Initial Contact with Selected Respondents

It was felt that the response of selected interviewees would be much higher if they received an initial letter of introduction from the Director of the Research and Planning Branch of the Department of Tourism, Recreation and Cultural Affairs. Consequently, Mr. Gordon D. Taylor wrote a letter of introduction dated October 26, 1971. A copy of this letter is attached as Annex IV. This letter was mailed to all respondents and in addition, all interviewers were given copies to show to any respondents who either doubted their legitimacy or could not recall receiving the letter.

As replacement interviewees were added to the list, letters of introduction were sent to them.

4. Interviewers and Interview Procedures

(a) Selection of Interviewers

It is generally accepted that the quality of the results obtained from a survey is influenced by the people who administer the survey and conduct the interviews. It is a well known fact that the best administrative procedures in any situation depend on the degree of control that can be exercised over the operation.

In interviewing, a coordinator of a project has virtually no control over the manner in which the interviews are conducted once the interviewer is in the field, the interjected biases created by the interviewee, or the accuracy of the results reported. Because of this, every attempt was made to obtain high calibre, diligent, personable interviewers.

Thirty-seven interviewers were selected in total and only two failed to conduct the number of interviews for which they initially committed themselves. Of the 37 interviewers, 26 were male and 11 were female.

(b) Training of T

Annex V contains all material that was used in the training sessions, with the exception of the Survey Questionnaire and the Voters Lists. The Questionnaire and Interviewer's Manual were distributed to the prospective interviewers several days in advance of the scheduled training session and interviewers were instructed to read the Interviewer's Manual in conjunction with the Survey Questionnaire and to come to the training session fully prepared to ask questions and seek a clarification of any points on which they were uncertain.

A three-hour training session was held on the evening of October 20, 1971. Attendance at this training session was mandatory and any applicants for interviewer positions who did not attend were automatically rejected from further consideration.

After introductions and a few brief explanatory comments on the nature of the position for which they were being trained, a complete review of the underlying reasons for the Lake Winnipeg Demand Study was given the interviewers so that they would be in a position to answer the general questions of respondents. In addition, the critical significance of the results of this study was highlighted and the students were made aware of the need for complete accuracy in recording and reporting information. The problems of interjected biases, poor interviewing, incomplete recording of questionnaire responses, sloppiness of recording, and falsification of interview results were highlighted and all interviewers were told that the coordinator of the study would be making random telephone calls to selected respondents who had been interviewed to check up on the effectiveness of the interviewers. Any interviewers who, in the opinion of the survey coordinator, were not complying with the rigid requirements of the job would be summarily dismissed.

The Questionnaire and the Interviewer's Manual were then reviewed in complete detail and instructions were given to the interviewers on the manner in which the Questionnaires were to be completed. Several interviewers sought clarification on the instructions and as a result of these queries, an addition to the Interviewer's Manual was printed and distributed to all interviewers subsequent to the session.

Additional questionnaires were then distributed to each

of the interviewers and they were instructed to pair up, interview each other, and complete the sample questionnaires exactly as if it was a legitimate interview. The coordinators supervised this session and went from one group to another offering assistance and advice. These sessions went very well and the response from the interviewers was most positive and informative.

The remaining part of the training session was spent reviewing details of locating selected respondents, interviewing techniques, and the maintenance of control systems and procedures initiated by the project coordinator. It was imperative that proper control be maintained if the interviews were to be conducted in a proper manner and the replacement interviewees selected at random. Interviewers were instructed to contact the selected interviewees by telephone and arrange for an appointment with them. At least three telephone calls at different times of day on different days were required before a replacement interviewee was selected by the survey coordinator. The complete instructions and forms utilized by the interviewers and the survey coordinator are included in Annex V. The details are self explanatory.

5. Interview Experience

(a) Replacement Required

A summary of interviewer experience is outlined in Table 2. In all, 298 replacements were required to complete the

TABLE 2

INTERVIEWEE REPLACEMENT EXPERIENCE BY WARD

Ward	No. of Inter- viewees Required	No. of Replace- ments Used	No Contact	Refused Inter- view	Moved or Undeli- verable	Deceased	Other
1	20	5	1	2	2		
2	23	6	5		1		
3	22	3	1	1	1		
4	22	20	3	11	3	1	2
5	19	4	1	2	1		
6	21	1	1				
7	20	3	1	1	1		
8	23	15	4	6	5		
9	21	10	6	3	1		
10	23	10	1	7	1		1
11	23	3	1	1	1		
12	22	18	3	9	2		4
13	18	2		1	1		
14	20	6	2	2	1	1	
15	23	9	4	3	2		
16	23	7	3	1	3		
17	17	4	1	2	1		
18	18	3		2	1		
19	19	2	1	2			
20	17	9	3	3	3		
21	21	4		4			
22	23	7	1	5	1		
23	21	10	2	6	1	1	
24	18	6	2	1	3		
25	16	4	1	2	1		
26	17	5	2	2	1		
27	17	6	1	2	2		1
28	22	5		3	1	1	
29	20	6	1	4	1		
30	25	11	3	5	3		
31	21	7	3	1	2	1	
32	12	2	1				1
33	13	3		3			

.....Continued

TABLE 2 (Continued)

INTERVIEWEE REPLACEMENT EXPERIENCE BY WARD

Ward	No. of Inter- viewees Required	No. of Replace- ments Used	No Contact	Refused Inter- view	Moved or Undeli- verable	Deceased	Other
34	14	4		2	1	1	
35	23	11	3	4	3	1	
36	23	3	1	1	1		
37	20	1		1			
38	20	4		3			1
39	22	5		1	4		
40	19	4	1	3			
41	21	8	1	6		1	
42	15	4		1	2		1
43	16	10	3	4	2	1	
44	17	5	2	1	2		
45	17	3	1	1		1	
46	26	1			1		
47	26	3	1	2			
48	23	9	2	4	3		
49	16	2		1	1		
50	22	5		3	2		
TOTAL	1000	298	74	134	69	10	11
Per Cent of Sample		29.8%	7.4%	13.4%	6.9%	1.0%	1.1%
Per Cent of Replacements		100.0%	24.8%	45.0%	23.2%	3.3%	3.7%

1000 interviews. This 29.8 per cent replacement figure is somewhat higher than was initially expected, but it is not abnormally high. The survey was not operational until November 1, 1971 and the majority of interviews were conducted during this month and the early part of December. Deteriorating weather conditions, examination pressure on the interviewers and the approach of the Christmas season, all served to both delay the completion of the interviews and increase the number of replacement interviewees required.

The breakdown of the replacements, as shown in Table 2, reveals that 45 per cent of replacements (or 13.4 per cent of the sample) was a direct result of interviewees refusing to cooperate with interviewers. This is higher than expected, but acceptable, given the time of year in which the survey was conducted. A further 23.2 per cent of the replacements (6.9 per cent of sample) no longer resided at the address shown in the Voters List. Another 24.8 per cent of the replacements were a result of failure to make contact with the primary respondent. This differs from the other category in which the respondents had moved in that the selected interviewees still resided at the address shown on the Voters List, but could not be successfully contacted either because they were out of town or otherwise unavailable.

A close examination of the replacement experience by ward reveals that there were noticeable differences among wards. The

ward with the poorest interview record was Ward No. 4, Kelvin. Twenty-two interviews were required from this ward and a total of 20 replacements were needed to complete the requirement. The experience in this ward, in the opinion of the survey coordinator, was largely due to the poor interviewer performance.

The other wards which had relatively poor interview experience were typically wards in which a large percentage of the population lived in apartments and there existed a high degree of locational mobility. These wards were Roslyn, Memorial, Westminster, Sargent Park, Balmoral, and Arlington. One other influencing factor appeared to be the economic stature of the area. Generally, the lower income areas of the city experienced a higher refusal rate than did the middle and higher income areas of the city.

(b) General Conclusions

i) Interviewers

The experience with the selected interviewers was most acceptable. The calibre and interest of the interviewers was above average, and results would indicate the group performed exceptionally well.

ii) Hours of Interviews

The interviewers found that the most productive hours for interviewing were in the early evening and Saturdays.

The average time to conduct an interview was approximately

twenty to thirty minutes, including the time spent for introductions and pleasantries. Most interviewers could only arrange two, or possibly three interviews for any one evening and this required efficient organization of their time. The most successful interviewers, however, became quite proficient at suggesting interview times and organized up to eight or ten interviews on a Saturday. The public was receptive to this approach and realized the need for interviewers to plan their time.

iii) Timing of Survey

The survey was conducted during November and the first half of December, 1971. This was not the best of times as the weather, Christmas season, and upcoming examinations of the student interviewers served not only to delay the completion of the interviews but increase the refusal rate.

It is suggested that a more appropriate time to complete such a survey, should one be conducted in the future, is September and October.

iv) Telephone Appointments, Cold Calls

Initially interviewers were instructed to telephone each of the selected respondents in order to arrange a mutually agreeable time for an appointment. In general, this worked well and the selected respondents appreciated participation in arranging appointment times. However, in several areas of the city, the interviewers found that their rejection rate was significantly

higher through attempting to use the telephone appointment system. Consequently, these interviewers switched to cold calling and attained a higher completion ratio. This was done with the complete agreement of the survey coordinator, on the understanding that the cold calls were conducted in an orderly fashion.

It is suggested that in future surveys the telephone appointment approach be continued, but in any cases where it appears to be ineffective, an attempt be made at cold calling to assure that completion ratios are being maximized.

(c) Control of interview and Interviewers

As indicated, the initial control and the quality of the survey results were achieved through the selection of interviewers. It is felt that a high calibre of interviewers will best assure realistic and reliable results.

The interviewers were instructed to contact the survey coordinator any time they faced questions for which they had no ready answers. The interviewers were specifically instructed not to interpret survey questions or otherwise influence the response of the selected interviewees. The interviewers were instructed to write any comments on the back of the questionnaire so that the project coordinator could consider the problem and make interpretations which would be consistent in all cases of a similar nature. The only areas in which there were any noticeable difficulties were employment classification and the number

of leisure days per year enjoyed by a housewife who did not work. These difficulties were considered minimal.

All interviewers had to maintain an accurate record of the status of each of the interviews for which they were responsible. All replacements were authorized by the survey coordinator and recorded by him. In this manner, it was possible to determine at any point in time the progress any interviewer was making with his assignment and the difficulties he was encountering. In addition, the method of allocating replacement interviewees was consistent and done in such a way that distortion of the sample was minimized. Copies of control forms are included in Annex V.

6. Survey Design and Data Processing

This section is intended to provide some basic information on design of the survey and processing of subsequent information. Interviewee selection and experience has already been described and all that remains is to clarify what information was requested of the interviewee and how this information was processed. A complete copy of the survey is provided in Annex III and the Interviewer's Manual and Revisions are found in Annex V. This information provides a thorough understanding of the major aspects of the survey design and information collection procedures.

It is important to note that a large part of the information collected through the survey had no direct relationship to a study of the Lake Winnipeg region. At the time of survey

design it was felt that if a thorough in-depth interview procedure was to be adopted, then to collect information relating to Lake Winnipeg only, would make poor use of the expenditure. Therefore, the Research and Planning Branch of the Department of Tourism, Recreation and Cultural Affairs felt that a great deal of related recreation information could be collected at no additional cost. This in fact was done and although not all of the information is included in this particular report, it is readily available in tabular form and will eventually be assembled into report form.

A major decision was required with respect to information being collected on those individuals not yet eighteen years of age. As the primary sample was obtained from the Unicity Voters List, it was obvious that some means of collecting information about individuals not yet eighteen years of age was required. To minimize error it was decided that in cases where a primary respondent was in fact the mother and/or guardian of a child or children under the age of eighteen, information would be provided by that mother or guardian on the activities of the children. Of major importance was the fact that where the primary respondent was a father information was not collected on his children. The only exception to this particular rule was in cases where there was an absence of a mother. This methodology was based on a study of numerous other survey designs made available by the Department of Tourism, Recreation and Cultural Affairs. In the majority of these reports it became apparent that prior experience dictated

for the most part that the father is unable to give accurate information on the activities of his children.

It is probably worth mentioning that the base of this particular survey rests on the information provided by the primary respondent. This is somewhat of a deviation from the general practice of collecting information on households. Although some information must be collected for the household, all activity information relates to the individual per se. This has certain advantages in analysing individual segments of population with respect to age, sex, income. Although this has no real significant implications for this particular study it has numerous advantages when examining specific socio-economic characteristics for the various parts of Metropolitan Winnipeg.

ANNEX II

BREAKDOWN OF SAMPLE BY WARDS

BREAKDOWN OF SAMPLE BY WAKES

WARD NUMBER AND NAME SAMPLE SIZE SECONDARY SAMPLE SIZE NET POPULATION

1	CHARLESWOOD PARK	20	4	6632
2	TUXEDO HEIGHTS	23	5	7669
3	CLEENSTON	22	4	7226
4	KELVIN	22	4	7318
5	GRANT PARK	19	4	6324
6	RIVERVIEW	21	4	6916
7	COCKBURN	20	4	6711
8	RCSLYN	23	5	7696
9	MEMORIAL	21	4	6748
10	WESTMINSTER	23	5	7509
11	PCLC PARK	23	5	7390
12	SARGENT PARK	22	4	7112
13	WESTON	18	4	5967
14	BANNATYNE	20	4	6396
15	CENTENNIAL	23	5	7576
16	RCSSEHOLSE	23	5	7525
17	TALBOT	17	3	5642
18	RIVERTON	18	4	5825
19	NCRQUAY	19	4	6325
20	STRATHCCNA	17	3	5646
21	CATHECRAL	21	4	6742
22	MYNARSKI	23	5	7522
23	AFLINGTON	21	4	6755
24	SISLER	18	4	5829
25	GARDEN CITY	16	3	5240
26	KILDONAN PARK	17	3	5662
27	JEFFERSON	17	3	5639
28	MILES MACDONNELL	22	4	7310
29	LEIGHTON	20	4	6625
30	KILNORTH	25	5	8294
31	SPRINGFIELD HEIGHTS	21	4	6687
32	JOHN GUNN	12	2	3810
33	KERN PARK	13	3	4325
34	REGENT PARK	14	3	4541
35	TACHE	23	5	7534
36	NCRWOOD	23	5	7563
37	LANGEVIN	20	4	6544
38	WINAKWA	20	4	6507
39	GLENLAWN	22	4	7271
40	FERNWOOD	19	4	6122
41	CAKCTA	21	4	7040
42	WILCWOOD	15	3	4882
43	MAYBANK	16	3	5093
44	UNIVERSITY	17	3	5500
45	KING EDWARD	17	3	5689
46	DEER LODGE	26	5	8410
47	SILVER HEIGHTS	26	5	8621
48	ECOTH	23	5	7599
49	KIRKFIELD	16	3	5278
50	ST CHARLES	22	5	6897

TOTALS

1000

200

327685

ANNEX III

QUESTIONNAIRE

1	2	3	4
---	---	---	---

0	1
5	6

7	8
---	---

WARD NUMBER

TYPE OF DWELLING

- 9
- | | | |
|---|---|--|
| <table border="1"><tr><td>1</td></tr></table> | 1 | SINGLE UNIT HOME |
| 1 | | |
| <table border="1"><tr><td>2</td></tr></table> | 2 | DUPLEX, TRIPLEX, FOURPLEX, MULTIPLEX (TOWN HOUSES) |
| 2 | | |
| <table border="1"><tr><td>3</td></tr></table> | 3 | APARTMENT (SELF CONTAINED) (COULD BE IN A HOUSE) |
| 3 | | |
| <table border="1"><tr><td>4</td></tr></table> | 4 | BOARDING HOUSE |
| 4 | | |
| <table border="1"><tr><td>5</td></tr></table> | 5 | OTHER |
| 5 | | |

OWNERSHIP

- 10
- | | | |
|---|---|----------------|
| <table border="1"><tr><td>1</td></tr></table> | 1 | OWNER/OCCUPIED |
| 1 | | |
| <table border="1"><tr><td>2</td></tr></table> | 2 | RENTED |
| 2 | | |
| <table border="1"><tr><td>3</td></tr></table> | 3 | RENT FREE |
| 3 | | |

INTERVIEWEE

NAME _____

ADDRESS _____

PHONE _____

NAME OF INTERVIEWER _____

ALL MEMBERS OF HOUSEHOLD

1	2	3	4
5	6		

PERSON NUMBER	RELATION TO HEAD OF HOUSE- HOLD OR IF UNDER 18 GIVE MOTHER # (WRITE IN)	CODE FOR RELATIONSHIP TO H.O.H. (OFFICE USE ONLY)	AGE	SEX		MARITAL STATUS			OCCUPATION (LIVLHOOD) (WRITE IN)	CODE FOR OCCUPATION (OFFICE USE ONLY)	AT SCHOOL		NO SCHOOL NOR OCCUPATION		INTERVIEWED		UNDER 18		OTHER CHILD NOT INTERVIEWED
				M	F	MARRIED	SINGLE	OTHER											
21				1	2	1	2	3			1	2	1	2	3				
22				1	2	1	2	3			1	2	1	2	3				
23				1	2	1	2	3			1	2	1	2	3				
24				1	2	1	2	3			1	2	1	2	3				
25				1	2	1	2	3			1	2	1	2	3				
26				1	2	1	2	3			1	2	1	2	3				
27				1	2	1	2	3			1	2	1	2	3				
28				1	2	1	2	3			1	2	1	2	3				
29				1	2	1	2	3			1	2	1	2	3				
30				1	2	1	2	3			1	2	1	2	3				
31				1	2	1	2	3			1	2	1	2	3				
11-12		13	14-16	17		18				19-20	21		22						

1234

0	3
5	6

129.

BY INTERVIEWEE ONLY. WHERE INTERVIEWEE IS MOTHER/GUARDIAN
INFORMATION FOR HIS/HER CHILDREN UNDER 18 TO BE SUPPLIED

1234

36

[illegible]

PERSONAL INTERVIEW IN PROVINCE

MAY 1/71 - EPT. 30/71

BY INTERVIEWEE ONLY. WHERE INTERVIEWEE IS MOTHER/GUARDIAN
INFORMATION FOR HIS/HER CHILDREN UNDER 18 TO BE SUPPLIED

$$\overline{1234}$$

5	6
---	---

[illegible]

PERSONAL INTERVIEW IN PROVINCE

MAY 1/71 - SEPT. 30/71

BY INTERVIEWEE ONLY. WHERE INTERVIEWEE IS MOTHER/GUARDIAN
INFORMATION FOR HIS/HER CHILDREN UNDER 18 TO BE SUPPLIED

1234

0 5

5 6

PERSON NUMBER	NAME OF PLACE VISITED	PLACE CODE (OFFICE USE)	NUMBER OF TRIPS	TOTAL DAYS OF VISIT	WEEKEND DAYS	WEEKDAYS	ACCOMMODATION USED MOSTLY							TRANSPORTATION USED MOSTLY					EQUIPMENT USED					ACTIVITIES: # OF DAYS															
							HOTEL	MOTEL	LODGE	COTTAGE	CAMP/TRAILER	FRIEND/RELATIVES	OTHER	AUTOMOBILE	AIRPLANE	TRAIN	BUS	OTHER	TENT	TEMT TRAILER	CAMPER TRAILER	TRAVEL TRAILER	SWIMMING	FISHING (BOAT)	FISHING (NO BOAT)	MOTOR BOAT	SAILING	CANOEING	OTHER BOATING	WATER SKIING	PICNICKING	HORSEBACK RIDING	GOLFING	TENNIS	SPECIAL EVENTS SPECT.	SPECIAL EVENTS PART.	WATERFOWL HUNTING	ALL OTHER HUNTING	
11		13	15	19	22	24	26							27										32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62
12		14	18	21	23	25																		33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63

WINTER ACTIVITIES

OCT. 1/70 - APRIL 30/71

BY INTERVIEWEE ONLY. WHERE INTERVIEWEE IS MOTHER/GUARDIAN
 INFORMATION FOR HIS/HER CHILDREN UNDER 18 TO BE SUPPLIED

1234

5 6

PERSON NUMBER	SNOWSKIING		CURLING		TOBOGGANING		SNOW- MOBILING		SNOW- SHOEING		ICE SKATING (ORGANIZED) (HOCKEY)		ICE SKATING (PLEASURE)		ICE FISHING		HUNTING WATER FOWL		HUNTING UPLAND GAME		HUNTING BIG GAME	
	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE	NUMBER OF DAYS	WHERE
	PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)		PLACE CODE (OFFICE USE)	
11 13	15 17		19 21		23 25		27 29		31 33		35 37		39 41		43 45		47 49		51 53		55	
12 14	16 18		20 22		24 26		28 30		32 34		36 38		40 42		44 46		48 50		52 54		56	

Oct. 1, 70 - Sept. 30, 71
 BY INTERVIEWEE ONLY. WHILST INTERVIEWING IS MOTIVATED/QUALIFIED
 INFORMATION FOR HIS/HER CHILDREN UNDER 18 TO BE SUPPLIED.

PERSON NUMBER	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MOVIE GOING FREQUENCY						
																				AT LEAST ONCE A WEEK	ONCE EVERY 2 WEEKS	ONCE A MONTH	ONCE EVERY 2 MONTHS	LESS THAN 6 TIMES A YEAR	NEVER	
FLIN FLOW TROUT FESTIVAL	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
THE PAS TRAPPERS FESTIVAL	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
MORRIS STAMPEDE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
MANISPHERE '71	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
GET TOGETHER '71	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
MUSEUM OF MAN & NATURE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
CONCERT HALL	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
PLANETARIUM	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
MAN. THEATRE CENTRE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
FESTIVAL DU VOYAGEUR	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
THOROUGHBRED HORSE-RACING, HARNES RACING, ASS'N DOWNS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
PROFESSIONAL FOOTBALL	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
ROYAL WPG. BALLET	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
ROYAL W.M. WINTER FAIR-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
BRANDON	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
CANADA'S NAT. UKRAINIAN FESTIVAL - DAUPHIN	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
NICKEL DAYS - THOMPSON	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
FOLKORAMA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
WINNIPEG SYMPHONY	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6
PUBLIC LIBRARY	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	1	2	3	4	5	6

1234

07
56

BY INTERVIEW ONLY. WHERE INTERVIEWED, IS MOTHER/GUARDIAN INFORMATION FOR HIS/HER CHILDREN UNDER 18 TO BE SUPPLIED.

148.

1234
5 6

BY INTERVIEWEE ONLY

NOTE: EXPECTATION IS IN 5 YEARS (FUTURE)

PERSON NUMBER	TRUCK, AUTO, BUS ETC.		MOTOR-CYCLE		SNOW-MOBILE		MOTOR-BOAT		SAIL-BOAT		CANOE		OTHER-BOAT		WATER SKIS		SNOW-SKIS		HUNTING EQUIP.		FISHING EQUIP.		GOLF CLUBS		TENT		TENT TRAILER		CAMPER TRAILER		COTTAGE		HOUSE	
	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN	OWN	EXPECT TO OWN		
11	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
12	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2

ANNEX IV

INTRODUCTION LETTER



DEPARTMENT OF TOURISM AND RECREATION
and Cultural Affairs

October 26, 1971

Dear Unicity Resident:

The Department of Tourism, Recreation and Cultural Affairs needs your assistance in planning the development of recreational facilities in the province.

The Department is conducting an extensive survey of individuals who were included in the voters' lists for the recent Unicity elections. You have been selected by our computer to participate in the study and I would appreciate it if you would agree to be interviewed at your convenience by one of our student employees.

You will be contacted within the next month by the student to arrange a convenient time to meet with you. The student will then come to your home for the interview and will require less than one half hour of your time. All questions are impersonal and of course all answers will be treated in strictest confidence.

Thank you for your interest and co-operation.

Sincerely yours,

Gordon D. Taylor
Director.

ANNEX V

TRAINING PROGRAM
AND
INTERVIEWER'S MANUAL

LAKE WINNIPEG RECREATION DEMAND SURVEY

ADDITIONS TO INTERVIEWER'S MANUAL

October 28, 1971

1. Make certain that all questionnaires have all pages. There are nine different pages in total. If required, restaple questionnaires. Do not mix pages of one questionnaire with those of another, as they are all prenumbered.

2. Pages 3 and 8.

There are questions relating to tents, tent trailers and camper trucks, but no questions about travel trailers. This is an error, but do not include travel trailers with any of the other items. Information about travel trailer ownership may be obtained by the Department from the Motor Vehicle Branch.

3. Page 3.

With respect to "use". Indicate that an individual has the use of an item only if it is a feasible or contemplated use. For example, the wife may readily have use of a motor boat owned by her husband. However for the purpose of the questionnaire she would not have the use of his golf clubs if she never plays golf or the clubs are not suitable for her to use. The same problem may occur with water skis, snow skis, hunting equipment and fishing equipment.

4. Page 5.

"Camper trailer" should read "camper truck". This is a truck fitted with a camping unit.

5. Page 9.

Work days per week, etc. When interviewing a woman who is a full-time housewife and does not work outside the home, the answers to these questions are to be given by the person who supports the household.

If the woman supports herself or helps support herself, she is to answer these questions herself.

October 20, 1971.

TO ALL INTERVIEWERS FOR THE LAKE WINNIPEG RECREATION SURVEY

A training session for all interviewers participating in this survey has been scheduled as follows:

Time: 7 - 10 p.m., Monday, October 25, 1971

Place: Room 141
Commerce Building
University of Manitoba

Attendance at this session is necessary.

The agenda is as follows:

1. Review of the questionnaire and instruction as to interview procedures and techniques.
2. Completion of sample questionnaires.
3. Review and discussion of questionnaires and any problems that arise.
4. Explanation of system of payment.

If you have any questions, you may contact me at Room 190 Commerce Building, or phone 474-9232 or 489-3443.

PETER G. PELLATT,
Associate Professor,
Faculty of Commerce.

LAKE WINNIPEG RECREATION DEMAND SURVEY
INTERVIEWER INSTRUCTIONS:
October 28, 1971.

1. If you have any questions about the questionnaire or an interview situation, contact:
P. G. K. Pellatt,
office telephone 474-9232
home telephone 489-3443
2. Obtain extra copies of the letter sent to all selected respondents to use in case they have misplaced the one sent to them. Use it if an interviewee does not recall the original letter or if they question your purpose etc.
3. Searching for telephone numbers:
The original voters' lists for the Wards you will be interviewing have been given to you. You will find these useful in finding the telephone numbers not listed under the respondent's name. Look in the voters' list under the address of the respondent and then search the telephone book for a telephone number for any other resident of the same address. This is especially helpful in the case of boarders and elderly people in apartments etc.
4. Instructions about telephoning:
Above all, be courteous.
Introduce yourself immediately and refer to the letter they will have received from G. D. Taylor of the Research and Planning Branch of the Department of Tourism, Recreation and Cultural Affairs.
Ask what time and day would be convenient for you to interview them. You should give them some general guide as to your availability and stress the importance of their part in the survey. Try to obtain interviews in the next day or two, as you do not want them to forget about the appointment with you. DO NOT ask if they would grant an interview, as this often gives them an easy opportunity to say no.
Try to group your interviews to make efficient use of your time.
Record the time and date of each telephone call you make. A form has been provided for this purpose. Do not phone earlier than 9:30 a.m. nor later than 9:30 p.m.
If you do not receive an answer on your first call, call back a second time on a different day and at a different time in order to improve your chance of successfully contacting shift workers etc. An excellent time usually is between 7:00 and 8:00 p.m.
Make at least three telephone calls as instructed above before you reject anyone as being unavailable.
If you contact someone other than the selected respondent at a residence, try to set up a tentative appointment then and leave your name and telephone number so they can contact you if it is not a convenient time. Otherwise, find out when the respondent will be in and call back. This return call does not count as one of the three required calls.

LAKE WINNIPEG RECREATION DEMAND SURVEY
INTERVIEWER INSTRUCTIONS:
OCTOBER 28, 1971.

PAGE 2.

5. Instructions about refusals, not-at-homes, etc.

First, please satisfy yourself that there is in fact no chance of obtaining an interview.

Telephone P.G.K. Pellatt to obtain a replacement respondent. You will be required to give the questionnaire number, name and address of the rejected interviewee. You will use the same questionnaire and will be given the new polling subdivision number and voter number. Look up the correct respondent in the voters' lists you have, write all details on a label and place this over the original name on the questionnaire. At the same time, complete a second label, put it on an envelope with the letter from G. D. Taylor in it and mail it. Give all details to P.G.K. Pellatt.

If the original questionnaire is unusable, notify P.G.K. Pellatt and use an un-numbered questionnaire. You MUST copy the number of the original questionnaire on EVERY PAGE of the new questionnaire. Return the unusable one to P.G.K. Pellatt.

6. Instructions about language difficulties:

If you encounter a respondent that does not speak a language you know, find out what languages they speak and contact P.G.K. Pellatt. Another interviewer will, if possible, be assigned. You will receive part credit for an interview.

7. Confidentiality of Answers:

The letter from G. D. Taylor assures interviewees that all information is to be completely confidential. All analysis will be based on the aggregate data and an individual's name will never be available to the programmers.

Respondents were selected at random by the computer from the voters' lists. P.G.K. Pellatt is the only one that has the interviewee names. The names appear on the first page of the questionnaire only for the convenience of locating interviewees. When the questionnaire has been completed, P.G.K. Pellatt will remove all names from the first page of the questionnaire before it is submitted to the Department.

158.

Address: _____

Social Insurance Number: _____

Marital Status: _____

Expense Cheque Authorized: Date: _____ Amount: _____

Pay Cheque Authorized: Date: _____ Amount: _____

LAKE WINNIPEG RECREATION DEMAND SURVEY
INTERVIEWER CALL RECORD

159.

Interviewer Name: _____

Page _____ of _____

[illegible]

A blank sheet of graph paper featuring a uniform grid of squares. The grid consists of 10 columns and 15 rows, creating a total of 150 square units. The lines are thin and black, set against a white background. There are no markings, text, or drawings on the grid.

LAKE WINNIPEG DEMAND STUDY

INTERVIEWER'S MANUAL

GENERAL INSTRUCTIONS

- 1) USE PENCIL ONLY -AND KEEP YOUR PENCIL SHARP.
- 2) QUANTITATIVE QUESTIONS -ON THESE TYPES OF QUESTIONS FILL IN THE APPROPRIATE NUMBER INCLUDING ZERO VALUES.
- 3) MULTIPLE CHOICE QUESTIONS -ANSWER WITH AN "X". ONE AND ONLY ONE CHOICE MUST BE SELECTED BUT NEVER LEAVE A QUESTION BLANK.

EXAMPLE:

<u>1</u>	OWN	_____
<u>2</u>	USE	_____
<u>3</u>	NEITHER	<u>X</u>

EXAMPLE:

<u>1</u>	HOTEL	_____
<u>2</u>	MOTEL	_____
<u>3</u>	LODGE	_____
<u>4</u>	COTTAGE	_____
<u>5</u>	CAMPGROUND/TRAILER PARK	_____
<u>6</u>	FRIENDS/RELATIVES	<u>X</u>
<u>7</u>	OTHER	_____

- 4) WHERE PROBLEMS ARISE, COMMENT ON BACK OF BOOKLET, AND INDICATE YOU HAVE MADE COMMENTS ON THE FRONT PAGE OF BOOKLET SO THEY WILL NOT GO UNNOTICED. DO NOT GUESS AT DESIRED MEANING OF QUESTIONS- ASK FOR AN INTERPRETATION FROM THE SUPERVISOR.

PAGE #1

THIS PAGE IS USED TO INDICATE CERTAIN INFORMATION ABOUT THE HOUSEHOLD UNIT WHICH WILL BE USED AS A REFERENCE NUMBER THROUGHOUT THE SURVEY IN QUESTION.

SPACE NUMBERS:

- 1-2-3-4 HOUSEHOLD NUMBER -FROM 1 TO 1000- WILL NOT BE ENTERED BY INTERVIEWER BUT WILL BE ENTERED PRIOR TO FORM DISTRIBUTION.
- 7-8 WARD NUMBER -FROM 1 TO 50 CORRESPONDING TO THE 50 WARDS DESIGNATED FOR THE UNI -CITY ELECTION. THE INTERVIEWER WILL NOT BE REQUIRED TO ENTER THESE CODES- THIS WILL BE DONE PRIOR TO FORM DISTRIBUTION.
- 9 TYPE OF DWELLING -THE INTERVIEWER WILL INDICATE IN THE SPACE PROVIDED. A BOARDING HOUSE IS THE SAME AS AN APARTMENT BUT IS NOT SELF CONTAINED.
- 10 OWNERSHIP -INTERVIEWER WILL INDICATE IN THE SPACE PROVIDED. THIS APPLIES TO THE HOUSEHOLD UNIT WHICH MAY OR MAY NOT INCLUDE ALL RESIDENTS OF THE DWELLING. (EX. A BOARDER OR BOARDERS OCCUPYING A SECTION OF A BOARDING HOUSE IS A HOUSEHOLD UNIT- THE INTERVIEWER DOES NOT CONSIDER THE ENTIRE BOARDING HOUSE).

PAGE 42

THIS PAGE IS USED TO ENUMERATE ALL MEMBERS OF THE HOUSEHOLD. REMEMBER IN THE CASE OF A BOARDING HOUSE A BOARDER OR GROUP OF BOARDERS OCCUPYING A GIVEN SPACE IS CONSIDERED AS A HOUSEHOLD UNIT. THE INTERVIEWEE MAY QUESTION ANY OR ALL OF THE HOUSEHOLD UNIT IN OBTAINING THIS DATA.

PERSON NUMBER: THERE ARE SPACES ENOUGH TO ENUMERATE 31 INDIVIDUALS WITHIN THE HOUSEHOLD UNIT. ALL THOSE 18 YEARS AND OVER ARE TO BE LISTED FIRST FOLLOWED BY THOSE UNDER 18 YEARS OF AGE. NUMBER ONE IS ALWAYS THE HEAD OF THE HOUSEHOLD.

RELATIONSHIP TO H.O.H. OR IF UNDER 18 MOTHER/GUARDIAN NUMBER WHERE AVAILABLE

ALL PEOPLE MUST BE CLASSIFIED INTO ONE OF THE FOLLOWING TWO CATEGORIES AND THE APPROPRIATE SUB CATEGORIES:

1) IF OVER 18:

RELATIONSHIP TO H.O.H.

- SPOUSE
- DIRECT OFFSPRING (SON OR DAUGHTER)
- OTHER BLOOD RELATIONSHIP -EX. AUNT, UNCLE, GRANDPARENT, ETC.
- INLAW RELATIONSHIP -EX. BROTHER-IN-LAW, SISTER-IN-LAW, ETC.
- NO RELATIONSHIP -EX. BOARDER, ETC.

2) IF UNDER 18:

- IF MOTHER/GUARDIAN HAS BEEN LISTED PLACE THE NUMBER OF THIS MOTHER/GUARDIAN IN THE SPACE.
- IF NO MOTHER OR GUARDIAN LISTED ENTER "NO MOTHER OR GUARDIAN."

OCCUPATION (LIVELIHOOD)

ALL PEOPLE MUST FALL INTO ONE OF 3 CATEGORIES:

- 1) OCCUPATION (LIVELIHOOD)
- 2) AT SCHOOL
- 3) NO SCHOOL OR OCCUPATION

OCCUPATION OR (LIVELIHOOD)

WRITE IN THE APPROPRIATE SPACE THE OCCUPATION OF THE MEMBERS OF THE HOUSEHOLD. PERSON FALLS INTO THIS CATEGORY WHEN SCHOOL OR OTHER ENDEAVOUR IS

OF SECONDARY PURPOSE. UNEMPLOYED PERSONS FALL IN THIS CATEGORY AND THEIR LIVELIHOOD IS "UNEMPLOYED."

AT SCHOOL

A PERSON FALLS INTO THIS CATEGORY WHEN ATTENDING SCHOOL IS HIS OR HER MAIN ENDEAVOUR AND AN OCCUPATION IS OF SECONDARY PURPOSE.

NO SCHOOL OR OCCUPATION

HOUSEWIVES, RETIRED, REFUSED TO ANSWER, AND OTHER ODD SITUATIONS.

THE LAST THREE COLUMNS ARE LABELLED:

- 1) INTERVIEWEE
- 2) CHILD UNDER 18
- 3) NEITHER CHILD NOR INTERVIEWEE

EACH PERSON MUST FALL INTO ONE OF THESE CATEGORIES AND ONLY ONE. MARK AN "X" IN THE APPROPRIATE SPACE.

THIS PAGE IS NEEDED TO GATHER INFORMATION WITH REGARD TO ALL MEMBERS OF THE HOUSEHOLD -ONE LINE PER PERSON LISTED ON PAGE 2.

INDICATE PERSON NUMBER AND FOR EACH ITEM INDICATE WHETHER:

- 1) OWN: INCLUDES OUTRIGHT OWNERSHIP, FINANCED TO OWN, LEASED.
- 2) USE: NOT OWNED BUT HAVE READY ACCESS TO THE ITEM; NO CHARGE FOR USE, NO REASON TO PURCHASE THE ITEM DUE TO EASE OF FREQUENCY OF ACCESS. WILL OFTEN INCLUDE THE SITUATION WHERE THE H.O.H. OWNS AN ITEM AND ALL OTHER MEMBERS OF THE HOUSEHOLD HAVE THE USE OF IT.

THE QUESTION OF OWNERSHIP OF MOST RECREATIONAL EQUIPMENT MAY BE ANSWERED BY DETERMINING WHO BOUGHT THE ITEM AND WHETHER OR NOT IT WAS FORMALLY GIVEN TO ANOTHER MEMBER OF THE HOUSEHOLD. GIFTS BECOME THE POSSESSION OF THE RECEIVER.

- 3) NEITHER: MUST BE SELECTED IF OTHER TERMS DO NOT APPLY.

MARK "X" FOR ONE AND ONLY ONE OF THE THREE ANSWERS BUT ONE MUST BE MARKED.

LODGE AND COTTAGE

LODGE: PRIMARY PURPOSE FOR HUNTING, FISHING OR OTHER SUCH SPORTING ACTIVITY. DISTINGUISHED FROM COTTAGE IN THAT THIS ESTABLISHMENT WOULD NOT BE USED AS A VACATION RESORT.

COTTAGE: USED PRIMARY AS A VACATION RESORT. NO SPECIFIC PURPOSE SUCH AS HUNTING, FISHING EVEN THOUGH MAY BE USED IN SUCH ACTIVITIES.

IN INDICATING LOCATION OF EITHER OF THE ABOVE TWO ITEMS WHERE SPACE IS INSUFFICIENT TO WRITE IN LOCATION THEN PLACE LETTERS (A,B,C, ETC.) IN SPACES AND WRITE ON BACK OF PAGE BESIDE APPROPRIATE LETTER.

1 EXAMPLE:

LODGE			COTTAGE		
NO. OWNED	PLACE MOST FREQUENTED	OFFICE USE ONLY	NO. OWNED	PLACE MOST FREQUENTED	OFFICE USE ONLY
1	A		1	B	

PLACE ON BACK OF SHEET:

A - DELTA MARCH

B - VICTORIA BEACH

PAGE #4

THIS PAGE IS TO BE ANSWERED BY THE SELECTED INTERVIEWEE ONLY, AND WHERE THIS INTERVIEWEE IS A MOTHER OR GUARDIAN OF CHILDREN UNDER 18 LIVING IN THE HOUSEHOLD THE INFORMATION PERTAINING TO THESE CHILDREN SHOULD BE SUPPLIED.

THE INFORMATION PERTAINS TO OUT OF PROVINCE TRIPS MADE BY THE INTERVIEWEE, AND WHERE INTERVIEWEE IS MOTHER OR GUARDIAN INFORMATION PERTAINING TO HIS OR HER CHILDREN IS TO BE SUPPLIED. THE PERIOD COVERED, OCT. 1, 1970 TO SEPT. 30, 1971.

ONLY LEISURE TRIPS ARE TO BE ENTERED, THAT IS TRIPS MADE OUT OF THE PROVINCE FOR PLEASURE PURPOSES. IF BUSINESS AND PLEASURE ARE COMBINED IN A PARTICULAR TRIP IT SHOULD BE DETERMINED WHICH WAS THE PRIMARY MOTIVE.

EX. -WOULD THE TRIP HAVE BEEN TAKEN HAD THE BUSINESS PORTION BEEN ABSENT-

IF NOT THEN THE PRIME MOTIVE MUST HAVE BEEN BUSINESS AND IT THEREFORE SHOULD NOT BE INCLUDED IN THE RESPONSE TO THE QUESTION.

PERSON NUMBER

ENTER INTERVIEWEE NUMBER IN FIRST BOX AND RE-LIST THIS NUMBER FOR EACH OUT OF PROVINCE DESTINATION. WHEN ALL TRIPS HAVE BEEN LISTED FOR INTERVIEWEE AND INTERVIEWEE IS MOTHER OR GUARDIAN, BEGIN LISTING CHILDREN NUMBERS AND THEIR PARTICULAR TRIPS. WHERE A CHILD HAS TAKEN IDENTICAL TRIPS AS MOTHER OR GUARDIAN A NOTE MAY BE MADE ON THE BACK OF THE SHEET (CHILD #6 SAME AS PERSON #2) AND THE FORM COMPLETED AT A LATER DATE SO AS NOT TO INCONVENIENCE INTERVIEWEE, HOWEVER, THE TRIPS MUST STILL BE LISTED FOR THE CHILD BEFORE TURNING IN THE QUESTIONNAIRE.

REMEMBER - THESE ARE LEISURE TRIPS.

WHERE NO LEISURE TRIPS HAVE BEEN MADE OUT OF PROVINCE THEN ENTER PERSON NUMBER AND PLACE ZEROS IN COLUMNS 2,4, AND 5 AND X "OTHER" UNDER ACCOMMODATIONS AND TRANSPORTATION SECTIONS. ALL PERSON NUMBERS INVOLVED MUST BE RECORDED WHETHER ANY TRIPS HAVE BEEN TAKEN OR NOT. IN MOST CASES THIS WILL ONLY BE THE INTERVIEWEE BUT WHEN INTERVIEWEE IS MOTHER OR GUARDIAN OF CHILDREN IN THE HOUSEHOLD THERE WILL BE THESE OTHER PERSON TO CONSIDER.

THIS PAGE IS USED TO INDICATE ALL LEISURE TRIPS TAKEN WITHIN THE PROVINCE (25 MILES ROUND TRIP FROM CITY) DURING THE PERIOD MAY 1, 1971 TO SEPT. 30, 1971. -(THIS WILL INCLUDE TRIPS TO BIRDS HILL PROVINCIAL PARK).

THE INFORMATION PERTAINS TO THE INTERVIEWER ONLY AND WHERE INTERVIEWER IS MOTHER OR GUARDIAN INFORMATION ON HIS OR HER CHILDREN UNDER 18 SHOULD BE SUPPLIED.

INDICATE PERSON NUMBER IN FAR LEFT COLUMN. ONE LINE IS NEEDED FOR EACH DESTINATION FOR EACH PERSON. DO ALL OF INTERVIEWEES DESTINATIONS FIRST AND THEN PROCEED WITH CHILDREN (UNDER 18) WHERE APPLICABLE.

WRITE IN NAME OF PLACE VISITED, NUMBER OF TRIPS DURING PERIOD IN QUESTION AND THE TOTAL DAYS AT THE LOCATION ON ALL TRIPS. ONCE TOTAL DAYS HAVE BEEN DETERMINED DIVIDE THIS FIGURE INTO WEEKEND AND WEEK DAYS SPENT AT THE LOCATION.

ACCOMMODATION USED MOSTLY -"X" THE APPROPRIATE TYPE- WHERE ONE DAY VISIT ONLY AND NO ACCOMMODATION USED "X" "OTHER".

TRANSPORTATION USED MOSTLY -"X" APPROPRIATE COLUMN.

EQUIPMENT USED -A YES OR NO ANSWER IS REQUIRED FOR EACH TYPE. NONE ARE TO BE LEFT BLANK. MARK WITH AN "X".

ACTIVITIES

FOR EACH ACITIVITY AT EACH LOCATION INDICATE THE NUMBER OF DAYS OF PARTICIPATION. EX. (IF SEVEN DAYS WERE SPENT AT GRAND BEACH AND THE RESPONDENT WENT SWIMMING ON ALL SEVEN DAYS PUT 7 IN THE SPACE PROVIDED. IF HE OR SHE WENT FISHING FOR SEVEN DAYS ALSO PUT 7 IN THE APPROPRIATE SPACE.) THE TOTAL NUMBER OF ACTIVITY DAYS AT ANY LOCATION DOES NOT HAVE TO BE THE SAME AS THE TOTAL DAYS AT THE LOCATION BECAUSE THE RESPONDENT MAY PARTICIPATE IN MORE THAN ONE ACTIVITY PER DAY.

NAME OF PLACE VISITED

WRITE IN NAME OF PLACE VISITED- OUT OF PROVINCE. WHERE NO ACTUAL DESTINATION WAS CHOSEN WRITE IN POINT OF FURTHEST TRAVEL FROM PROVINCE. (PROVINCE OR STATE IS ACCURATE ENOUGH).

NUMBER OF TRIPS

ONCE A DESTINATION IS DECIDED DETERMINE NUMBER OF TRIPS TO THE DESTINATION.

TOTAL DAYS OUT OF PROVINCE

THIS IS THE TOTAL DAYS OUT OF THE PROVINCE SPENT ON ALL TRIPS TO A PARTICULAR DESTINATION. (INCLUDING TRAVEL TO AND FROM)

ACCOMMODATIONS USED MOSTLY

MARK WITH AN X THE APPROPRIATE SPACE. WHERE THE RESPONDENT WAS ONLY OUT OF THE PROVINCE FOR A DAY AND DID NOT STAY OVERNIGHT MARK AN "X" UNDER OTHER.

WHEN VISITING FRIENDS OR RELATIVES AT A COTTAGE, LODGE, CAMPGROUND OR TRAILER PARK, THE INTERVIEWEE WAS RECEIVING ACCOMMODATION FROM FRIENDS OR RELATIVES AND FOR THE PURPOSE OF THE QUESTIONNAIRE WAS NOT UTILIZING THE SAID ACCOMMODATION. THEREFORE MARK "X" UNDER THE HEADING "FRIENDS/RELATIVES."

TRANSPORTATION USED MOSTLY (TO REACH DESTINATION)

MARK THE APPROPRIATE SPACE WITH AN "X".

PAGE #6

THIS PAGE DEALS WITH THE WINTER ACTIVITIES OF THE INTERVIEWEE AND IF THE INTERVIEWEE IS A MOTHER OR GUARDIAN THE ACTIVITIES OF HIS OR HER CHILDREN UNDER 18 WHO ARE MEMBERS OF THE HOUSEHOLD ARE TO BE INCLUDED. THE TIME PERIOD IN QUESTION IS OCT. 1, 1970 TO APRIL 30, 1971. THIS APPLIES TO PLEASURE TRIPS ONLY (AS DEFINED) WITHIN PROVINCE BUT AT LEAST 25 MILES ROUND TRIP FROM CITY.

PERSON NUMBER

LIST INTERVIEWEE NUMBER IN FIRST BOX AND CONTINUE DOWNWARD FOR AS MANY BOXES AS REQUIRED. IF INTERVIEWEE IS MOTHER OR GUARDIAN FOLLOW WITH CHILDREN NUMBERS IF MEMBERS OF HOUSEHOLD. WHERE NO ACTIVITY HAS TAKEN PLACE LIST PERSON NUMBER AND PLACE ZEROS IN ALL BOXES IN APPROPRIATE ROW.

NUMBER OF DAYS

INDICATE NUMBER OF DAYS AT EACH SEPARATE LOCATION FOR EACH ACTIVITY.

ICE SKATING ORGANIZED- THIS IS ORGANIZED EVENT- HOCKEY GAMES, ETC.

IT IS SUGGESTED THAT THE INTERVIEWEE PROCEED BY ACTIVITY (EXAMPLE SNOWSKIING) AND DETERMINE THE NUMBER OF DAYS SPENT AT EACH LOCATION FOR THAT ACTIVITY BY THE INTERVIEWEE. FOR EXAMPLE, THE INTERVIEWEE MAY HAVE SPENT 3 DAYS SNOWSKIING AT FALCON LAKE AND 2 DAYS AT RIDING MOUNTAIN. IT HAS BEEN FOUND THAT IT IS EASIER FOR THE INTERVIEWEE TO RECALL THE TRIPS MADE FOR EACH TYPE OF ACTIVITY RATHER THAN TO RECALL ALL THE ACTIVITIES FOR A GIVEN LOCATION.

ANY ACTIVITIES NOT PARTICIPATED IN ON A USED LINE MUST BE FILLED IN WITH ZERO VALUES.

PAGE #7

ALL INFORMATION ON THIS PAGE REFERS TO THE PERIOD FROM OCTOBER 1, 1970 TO SEPT. 30, 1971. THE QUESTIONS ARE TO BE ANSWERED BY THE INTERVIEWEE ONLY AND WHERE THE INTERVIEWEE IS A MOTHER OR GUARDIAN OF CHILDREN UNDER 18 LIVING IN THE HOUSEHOLD THAT INTERVIEWEE IS TO ANSWER QUESTIONS PERTAINING TO THOSE CHILDREN.

PERSON NUMBER

LIST INTERVIEWEE NUMBER IN FIRST SPACE AND IF MOTHER OR GUARDIAN OF CHILDREN LISTED IN HOUSEHOLD THEN LIST CHILDREN NUMBERS ALSO.

- ANSWER YES-NO TO EACH EVENT OR ITEM. (MARK WITH AN X)
- MARK WITH AN X THE MOST APPROPRIATE MOVIE GOING FREQUENCY
- ALL QUESTIONS MUST BE ANSWERED

PAGE #8

THIS PAGE IS TO BE ANSWERED BY THE INTERVIEWEE ONLY. THIS QUESTION DETERMINES PRESENT OWNERSHIP AND EXPECTED OWNERSHIP IN FIVE YEARS.

THIS QUESTION IS NOT DESIGNED TO DETERMINE WANTS BUT EXPECTATIONS WITHIN THE CONSTRAINTS OF THE INTERVIEWEE'S PRESENT AND FUTURE EXPECTED EARNINGS AND FINANCIAL CONDITION.

MARK "X" FOR EACH ITEM FOR PRESENT AND EXPECTED OWNERSHIP. THERE MUST BE NO BLANKS.

OWNERSHIP IS DEFINED TO INCLUDE OUTRIGHT OWNERSHIP, FINANCED TO OWN OR LEASED ON FAIRLY LONG TERM BASIS (CARS). RENT ON A HOUSE IS NOT OWNERSHIP. REMEMBER THE DIFFERENCE STATED EARLIER BETWEEN OWNERSHIP AND USE. DON'T LET INTERVIEWEE GENERALIZE A HOUSEHOLD ITEM AS PERSONAL OWNERSHIP UNLESS INTERVIEWEE IS ACTUAL OWNER AS DEFINED.

THIS PAGE COVERS THE PERIOD FROM OCTOBER 1, 1970 TO SEPT. 30, 1971. IT IS TO BE ANSWERED BY THE INTERVIEWEE ONLY EXCEPT WHERE THE INTERVIEWEE IS A MOTHER OR GUARDIAN IN WHICH CASE INFORMATION ON HIS OR HER CHILDREN (UNDER 18) LIVING IN THE HOUSEHOLD SHOULD BE SUPPLIED.

PLACE PERSON NUMBER OF INTERVIEWEE AND GIVE INCOME OF INTERVIEWEE NOW AND EXPECTED INCOME IN FIVE YEARS. THIS IS EXPECTED INCOME FIVE YEARS HENCE- ASK THE RESPONDENT TO BE REALISTIC. IF RESPONDENT IS MOTHER OR GUARDIAN LIST CHILDREN NUMBERS AND INDICATE PRESENT INCOMES WHERE KNOWN. EXPECTED INCOMES OF CHILDREN IN FIVE YEARS IS UNNECESSARY. IF INCOME IS REFUSED OR UNKNOWN "X" APPROPRIATE COLUMN. IT IS SUGGESTED THAT THE QUESTION ABOUT WORK DAYS AND VACATION DAYS ETC. BE ASKED BEFORE INCOME QUESTIONS.

LEISURE DAYS PER YEAR

INDICATE WORK DAYS AND/OR SCHOOL DAYS PER WEEK OR PER MONTH- WHICH EVER IS CONVENIENT FOR INTERVIEWEE. IF THE INTERVIEWEE IS A MOTHER OR GUARDIAN ANSWER SHOULD BE SUPPLIED FOR HIS OR HER CHILDREN LIVING IN HOUSEHOLD.

SICK DAYS, DAYS LEAVE OF ABSENCE, DAYS LAIDOFF, -INDICATE NUMBER OF DAYS TAKEN DUE TO THESE ITEMS IN YEAR OF QUESTION. IF INTERVIEWEE IS MOTHER OR GUARDIAN INFORMATION SHOULD BE SUPPLIED FOR HIS OR HER CHILDREN UNDER 18 YEARS OF AGE. STATUTORY HOLIDAYS -AND/OR DAYS IN VIEW OF STATUTORY HOLIDAYS)

THERE ARE 10 SUCH HOLIDAYS PER YEAR. INDICATE IN SPACE PROVIDED THE NUMBER RECEIVED BY THE INTERVIEWEE AND IF INTERVIEWEE IS MOTHER OR GUARDIAN INFORMATION ON HIS OR HER CHILDREN (UNDER 18) LIVING IN THE HOUSEHOLD SHOULD BE SUPPLIED.

VACATION DAYS -THESE ARE TOTAL VACATION DAYS NOT INCLUDING WEEKENDS. (EX. 2 WEEKS EQUALS 10 DAYS). IF INTERVIEWEE IS MOTHER OR GUARDIAN INFORMATION SHOULD BE SUPPLIED FOR HIS OR HER CHILDREN (UNDER 18) LIVING IN THE HOUSEHOLD.

IN CASE OF STUDENT WITH SUMMER VACATION (2 MONTHS OR 4 MONTHS) DO NOT WRITE IN SIMPLY 60 OR 120 DAYS BECAUSE THIS INCLUDES WEEKENDS. A TWO MONTH VACATION IS 42 DAYS AND A ^{1 1/2} MONTH VACATION IS 84 DAYS.

THE COMMENT COLUMN CAN BE USED TO INDICATE ODDITIES IN INCOME OR ANY OTHER ITEM WHERE AN EXPLANATION WOULD PROVIDE NEEDED INFORMATION.

ANNEX VI

INVENTORY OF ACCOMMODATION

ACCOMMODATION
(LAKE WINNIPEG REGION)

Area	Location	Name	Type of Accommodation	Total No. of Units or Bldgs.	Star Rating				Total # of Campsites	Type of Sites		Fee Structure		Percent Occupancy Rate		Estimated Value		Season	Other
					1	2	3	4	5	Unser	Elec	Preserv	Daily	Wkly.	Seas.	Bldgs.	Land		
#1	Victoria Beach	Old Mill Tenting Ar.	Designated Tenting area																
	R.M. of V.Bch.		Cottages	908						X						2,440,875	1,597,632	4,038,507	May-Sept.
	R.M. of V.Bch.		Residents	33											100%	156,304	55,608	211,934	Summer
	R.M. of V.Bch.		Seasonal Report	6												44,510	30,279	74,790	Seas.
	R.M. of V.Bch.		Commercial	13												78,163	35,270	113,393	Summer
#2	Albert Beach		Cottages	44															Admin. by M & H Res.
	Hillside Beach	Hillside Bch. Resort	Resort Area	6						Area Tent.			6.00	35.00	100% (July - Aug. 15)			125,000	Summer
	Hillside Beach	Birchwood Hotel	Hotel	6															Seas.
	RM Alexander		Cottages	285												816,098	393,343	1,209,440	Summer
	RM Alexander		Residents	37											100%	97,936	29,196	127,133	
#3	RM Alexander		Commercial	2												15,973	2,344	18,318	
	RM Alexander		Seasonal Report	2												34,487	2,695	41,512	Summer
	RM Alexander		Cottages	12															Admin. by M & H Res.
	RM Alexander		Campground Cottages	47						795	645	110			96.500				Summer
	RM Alexander		Residents	294											100%	1,211,663	238,549	1,350,211	Seas.
#4	RM of Blfrost		Commercial	55												511,110	50,297	561,347	
	RM of Blfrost		Seasonal Report	3												28,767	1,403	30,170	Summer
	RM of Blfrost		Cottages	3												2,520	2,096	8,377	
	RM of Fisher		Residents	5												12,364	4,068	16,353	Seas.
	RM of Fisher		Rooms	4									8.00	8.00				25,000	
#5	Beila Island	Oak Harbour Lodge	Tenting							10									Admin. by M & H Res.
	Oak Harbour Camp		Cottages	49															May - Sept.
	Oak Harbour Camp		Campground																June - Sept.
	Oak Harbour Camp		Cabins	6									12.00	72.00					May - Dec.
	Oak Harbour Camp		Tenting Trailers										1.00	1.00					May - Dec.
#6	Dauphin River	Provincial Camp	Cabins	6									1.00	1.00					May - Dec.
	Dauphin River	Sturgeon Bay Trailer Park	Tenting Trailers										1.00	1.00					May - Dec.
	Dauphin River	Finchman's Camp & Outfitting	Rooms	16									7.00	7.00					May - Dec.
	Dauphin River	La Belle Hotel	Cabins	15									10.00	10.00					June - Sept.
	Dauphin River	Plum Grove Cabins	Cabins	6									4.00	4.00					June - Sept.
#7	Grand Rapids	Riverview Cabins	Cabins	6									2.00	2.00					June - Sept.
	Grand Rapids	Grand Rapids Camp & Trailer Park	Tenting Trailers										4.00	4.00					June - Sept.
	Grand Rapids	Prov. Campground	Rooms	8									1.50	1.50					June - Sept.
	Grand Rapids	North Star Hotel	Rooms	8									4.00	4.00					June - Sept.
	Grand Rapids																		June - Sept.

*Cabins, Hotels, Cottages, Resorts. see usually full from July 1st to August 15th. see Cabins 26.00
 **Cottages, 1.50 see 9.00
 ***Rooms, 2.50 see 12.00
 ****Trailers, 7.00 see 15.00
 *****Rooms, 2.50

ACCOMMODATION

Area	Location	Name	Type of Accommodation	Total No. of Units or Bldgs.	Star Rating					Total # of Campground Sites	Type of Sites		Fee Structure Daily Wkly. Seas.	Percent Occupancy Rate	Estimated Value		Season	Other		
					1	2	3	4	5		Under Easement	Perry			Bldgs.	Land			Total	
#1	Victoria Beach	Old Mill Tenting Ar.	Dedicated Tenting area	908							X						May-Sept.	Under Constr.		
	R.W. of V.Bch.		Cottages												2,660,875	1,597,632	4,038,507	Summer		
	R.W. of V.Bch.		Residents	33										100%	356,326	55,608	211,934	Seas.		
	R.W. of V.Bch.		Seasonal Report	6											44,310	30,279	76,790	Summer		
	R.W. of V.Bch.		Commercial	13											78,163	35,270	113,393			
#2	Albert Beach		Cottages	44													Admin. by M & B Res.			
	Hillside Beach	Hillside Bch. Resort	Resort Area	6	X						Acre Tent.	6.00	35.00	100% (July - Aug. 15)		125,000	June-Sept.			
	Hillside Beach	Birchwood Hotel	Hotel	6													Seas.			
	RW Alexander		Cottages	285											816,098	393,342	1,209,440	Summer		
	RW Alexander		Residents	17										100%	97,936	29,196	127,133			
#3	RW Alexander		Commercial	2											15,973	2,344	18,318			
	RW Alexander		Seasonal Report	2											36,867	2,625	41,512	Summer		
	Ironwood Pl.		Cottages	12													Admin. by M & B Res.			
	Grand Beach	Grand Bch. Prov. Ph.	Campground	16				X		795	685	110	ee	eee	56,550	20% (Mar. 15 - Sept. 30)	May 21 - Nov. Avail. Responder	Summer		
	Grand Beach	Grandsome Motor Hotel	Hotel	525									6.00				350,000	Seas.		
#4	Grand Beach		Cottages														Admin. by P&B, R.			
	Grand Marels	Ashgrove Cottages	e	3	X									eeee			May-Sept.			
	Grand Marels	Grand Haven Cottages	e	7	X							8.00	35.00	eeee			May-Sept.			
	Grand Marels	Haseldene Cottages	e	4	X							12.00	45.00	eeee			May-Sept.			
	Grand Marels	Million Cabins	e	8	X							6.50	35.00	eeee		28,000	May-Sept.			
	Grand Marels	Jo-Jam Cabins	e	5	X							40.00		eeee			May-Sept.			
	Grand Marels	Kemp Esqy Cottages	e	6	X							10.00	35.00	eeee			May-Sept.			
	Grand Marels	Lake Haven Hotel	e	16	X							15.00	65.00	eeee			May-Sept.			
	Grand Marels	Lyncrest Cottages	e	5	X									eeee			May-Sept.			
	Grand Marels	McMillen's Hotel	e	12	X							5.00		eeee			June-Sept.			
	Grand Marels	Parkview Cabins	e	8	X									eeee			May-Sept.			
	Grand Marels	Reefring Cottages	e	6	X									eeee			May-Sept.			
	Grand Marels	Rockwood Cottages	e	4	X							45.00		eeee			May-Sept.			
	Grand Marels	Sunny View Hotel & Cabins	e	10	X							45.00	50.00	eeee		378,618	99,790	478,409	Seas.	
	RW St. Clemente		Residents	105									50.00	100%			431,578	96,590	528,169	Summer
#5	RW St. Clemente		Commercial	36											123,265	39,952	163,217	Summer		
	RW St. Clemente		Seasonal Report	21															Summer	
	RW St. Clemente		Cottages	1,233											3,155,293	928,348	4,083,642	Summer		
	Patricia Beach		Campground																	
	Libau		(Accommodation facilities exist; however town of Libau not in study area--the nearby islands only)																	
#5	Petersfield	Onley's Lodge & Cabins	6-Cabins & 6-Bldgs		X				60	10	10	40	ee	55%			150,000	June-Sept.		
	Petersfield	Scottman's Paradise Lodge	Cabins	8	X			31			25	6	12.00	Depends on Flooding				June-Sept.		
	Petersfield	Petersfield Park	Cabins	6	X															
	Wanliping Beach	Wg. Beach Hotel	Rooms	14								4.25		13%			225,000	Seas.		



Explanation and Terms of Reference for the Accommodation Inventory Chart:
Cottages, Residents, Commercial Properties, Seasonal Reports (include with
Annex VI)

The shoreline properties included in the accommodation chart were determined by the following terms of reference as indicated by the Municipal Planning Branch.

- 1) The survey includes all municipalities bordering on Lake Winnipeg and its tributaries. Included are properties in L.G.D. Fisher and L.G.D. Alexander plus recreational properties on the Netley Drainage System and the Red River.
- 2) All buildings and land within one mile of the shoreline are included in the survey with the exception of rural lands and agricultural buildings including farm residences.
- 3) Present market value was estimated by applying a conversion factor to the assessed value. This conversion factor was derived from an overall estimate of the ratio of the current market values of a sample of properties to their assessed values.
- 4) The contour information was supplied by the Surveys Branch, Department of Mines, Resources and Environment Management.
- 5) Seasonal Report category refers to accommodation facilities which are used on a seasonal basis but which are not cottages, hotels, motels, or commercial units.
- 6) The commercial establishments listed in the accommodation table do not provide accommodation facilities, but they are indirectly related to accommodation services, as they include primarily restaurants and service stations.
- 7) Residents, as interpreted in the accommodation table, are those who have permanent homes in the Lake Winnipeg area. They provide accommodation

for visiting friends and relatives and are considered a major source of accommodation services because of their year-round status.

- 8) Information on hotels, motels, cabin rentals and trailer villages were obtained from four main sources: the Department of Tourism, Recreation and Cultural Affairs (Tourist Branch); Manitoba Liquor Control Board; the Vacation Handbook; and personal observation of the study area.
- 9) The star rating system utilized in the accommodation basis applies only to hotels, motels and resorts. It classifies the standard of facilities and services provided under the following system:
 - 5 star rating - deluxe accommodation provided in each individual unit, complete comforts, furnishings and conveniences consistent with the highest standards by government regulations.
 - 4 star rating - accommodation with full plumbing, with individual shower or bath in each unit, plus all high standard facilities necessary to provide guests with the recognized comforts of guest accommodation.
 - 3 star rating - accommodation may have individual plumbing in each unit, but if not, must have modern central toilet and washroom facilities and other essential conveniences of a 4-star operation.
 - 2 star rating - accommodation need not have modern facilities but must be equipped with adequate and sanitary outdoor type toilets. Interior walls need not be finished. Must have power. Must have necessary conveniences.
 - 1 star rating - accommodation comes up to the minimum requirements. Need not have electricity or finished walls. Must have minimum comfort facilities.

10) Government administration and/or ownership:

Note carefully that the number of cottages which are administered by the government are not included in the total assessment of cottages as given by the municipal planning branch. Government administered cottages at Albert Beach, Ironwood Point, Grand Beach and Beaver Creek have to be added to the number of cottages already assessed by the municipal planning

branch.

The results are:

Cottages listed by municipal planning branch	6,078
Cottages administered by government	630
Total number cottages	6,708

11) Facilities available:

The facilities which have been provided at the government operated campgrounds have been classified according to the standard symbols used in the vacation handbook. These symbols and their interpretation are as follows:

- B - beach
- C - cooking facilities (barbecue pits, wood stoves)
- D - dock
- E - electricity
- F - fishing
- K - kitchen shelter
- M - modern sanitary facilities
- N - non-modern sanitary facilities
- P - playground equipment for children
- R - ramp -natural or constructed suitable for boat launching
- SW - sewer and water connections for trailers
- W - water suitable for drinking
- X - sewage disposal station

ANNEX VII

INVENTORY OF RECREATIONAL FACILITIES

LAKE WINNIPEG DEMAND STUDY
INVENTORY OF RECREATIONAL FACILITIES

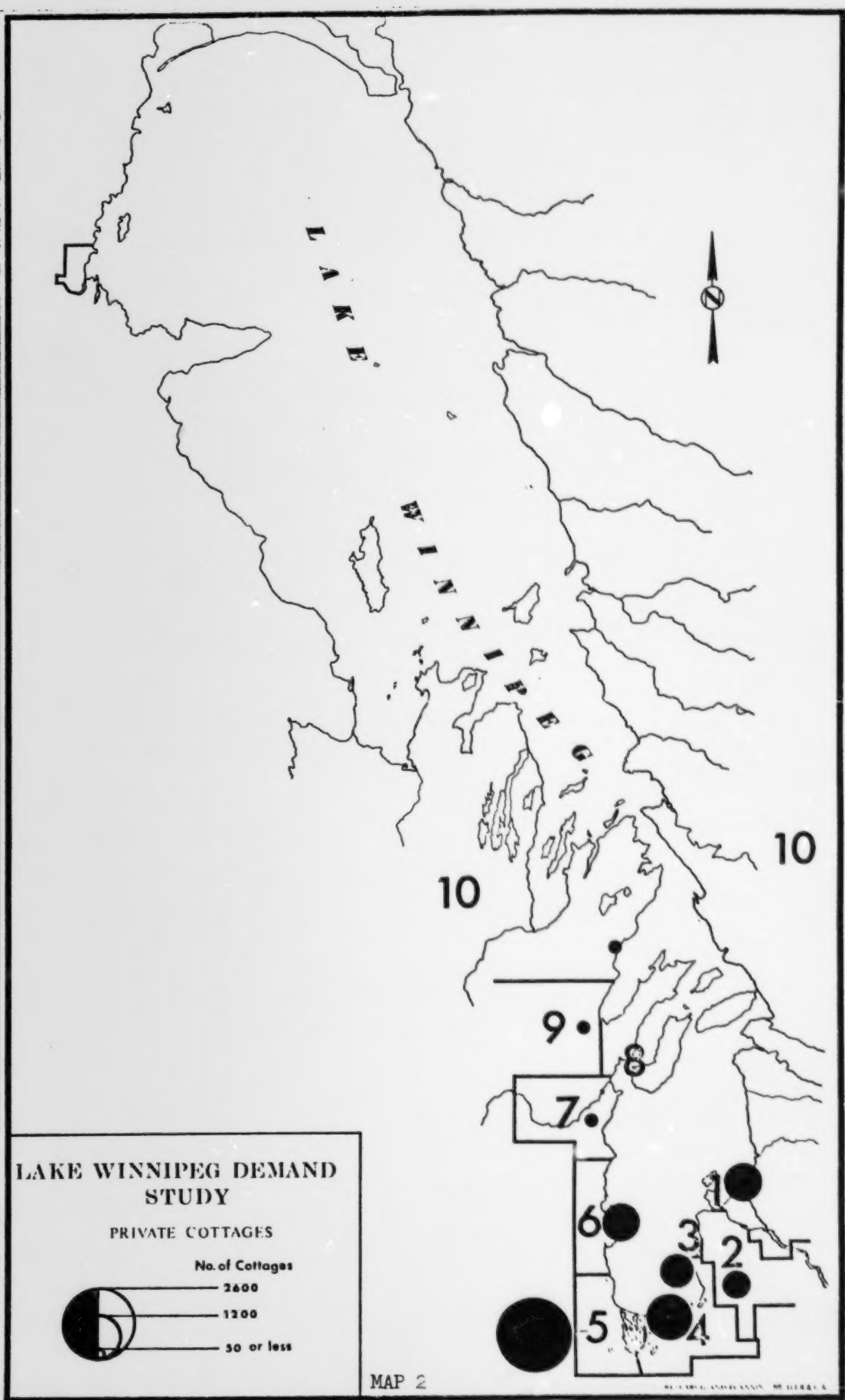
AREA LOCATION	POP.	COMMUNITY HALL	ARENA	GYMNASIUM	THEATRE	ATHLETIC FIELDS	SKATING RINKS	OUT-DOOR RINKS	PLAY-GROUNDS	GOLF COURSES	RIDING ACADEMY	RECREATION (GENERAL)	CULTURAL SOCIAL FACILITIES	OTHER
#1 Victoria Beach	17	1-summer only 1-seasonal	-	-	-	Baseball Football	Natural Ice 2 Sheets			9 Holes Fee \$1.50	X	Tennis Court	Museum Library - summer only	
#2 (USE FACILITIES PROVIDED AT VICTORIA BEACH AND GRAND MARAIS)														
#3 Grand Beach Prov. Park		1-summer only												Multi-Purpose Games Area
Grand Marais	334	1-60' by 30'			1-summer only	Baseball	Natural Ice 2 Sheets				X		Museum	Amusement Park (summer only)
Beaconsfield	62	1-seasonal				Baseball					X			Use Grand Marais facility
Scatterbury Liban	97	(COMMUNITY RECREATIONAL FACILITIES ARE AVAILABLE; BUT STUDY ONLY INCLUDES MARSHLAND)												
Petersfield	171	1-100' by 60'				Football Baseball	Natural Ice 3 Sheets							
Winnipeg Beach	623	1-65' by 45'	1 Natural Ice			Soccer Baseball Field Hockey	Natural Ice 4 Sheets			9 Holes Fee (\$1.25-\$2.00)		1-tennis 9 Courts Volley Ball	Multi-Purpose Fields	
Gladi	2,919	1-90' by 46' 1/2 1-48' by 30' 1/2 1-46' by 40' 1-150' by 99'	1 Artificial Ice	1-45' by 75' 1-55' by 60'	1 - 300 seats	Soccer Baseball Football Field Hockey Track & Field	Artificial Ice 4 Sheets				X	'Rec.' areas for summer use	Library - 2,000 Vol. Library 10,000 Vol.	
Sandy Hook	136					X				9 Holes Fee \$1.50-\$2.00				
Arnes						X				9 Holes Fee \$2.00-\$2.50				
Riverton	912	1-50' by 30' 1-60' by 20' 1-100' by 40'	1 Natural Ice	1-78' by 57' 1-45' by 42'	1-400 seats	Baseball Multi-Purpose Field	Natural Ice					Rifle Range	Library - 5,000 Vol. Library - 2,000 Vol. Library - 2,500 Vol.	
#6 (NO SIGNIFICANT POPULATION CENTRES)														
Hecla Island Prov. Park														
Grand Rapids	561	1-40' by 36' 1-30' by 60' 1-40' by 40'				Baseball	Natural Ice 2 Sheets						Library - 500 Vol.	
Manitowagan	186	1-40' by 20'				Baseball								
Norway House	676	X	(INVENTORY NOT COMPLETE)			X								
Matheson Island	122	X	(INVENTORY NOT COMPLETE)			X								

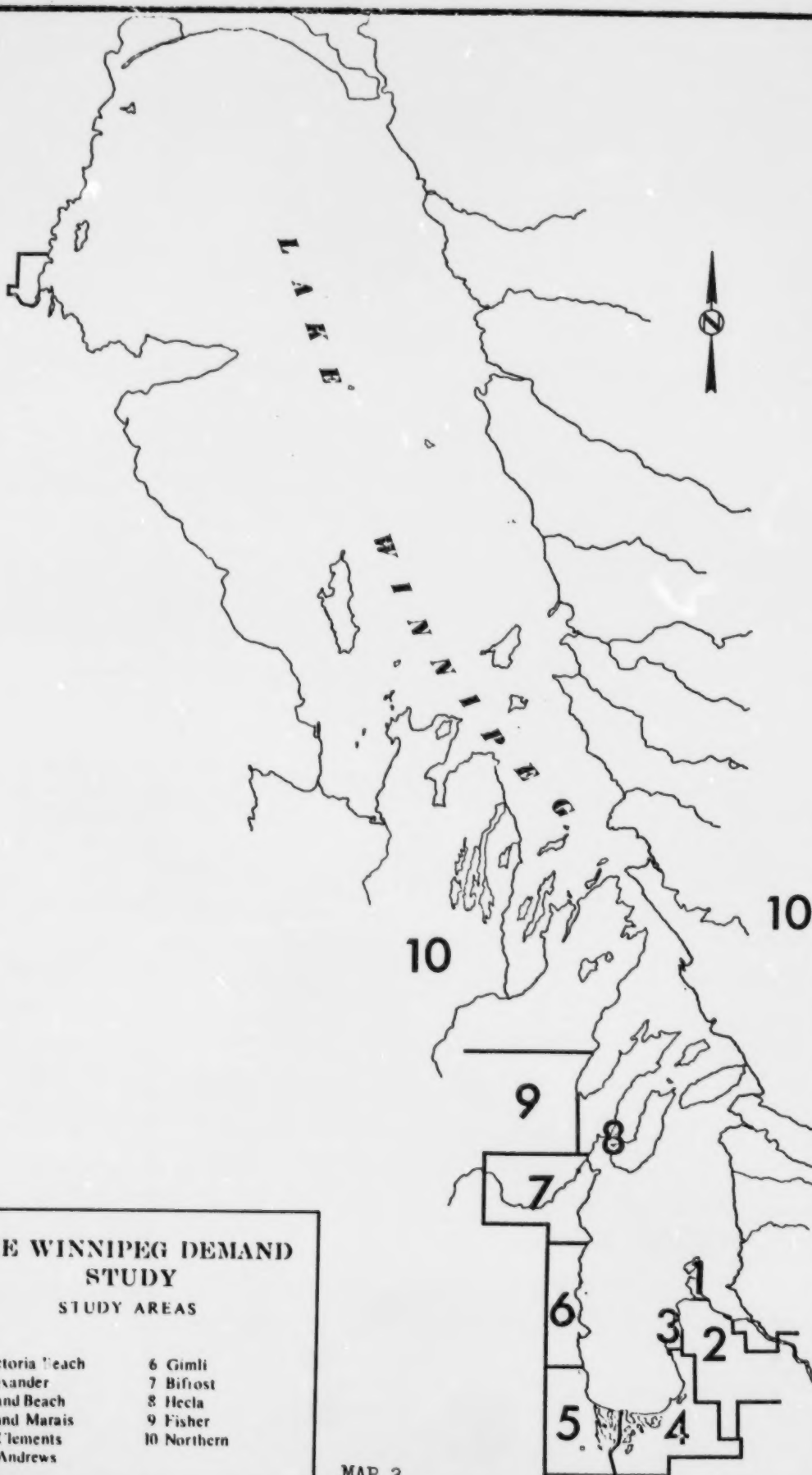
ALL OPPORTUNITIES (NOT NECESSARILY UNDER SUPERVISION)

ALL OPPORTUNITIES (HOCKEY - FAMILY SEATING)

ANNEX VIII

MAPS





APPENDIX 7 - B
RECREATION ASSESSMENT
OF THE OUTLET LAKES AREA

RECREATION ASSESSMENT
OF THE
OUTLET LAKES AREA

by

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Parks Branch
Manitoba Department of Tourism, Recreation and Cultural Affairs
Winnipeg, Manitoba
April, 1973

for

THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD

SPECIAL NOTE

THE CONCLUSIONS AND RECOMMENDATIONS CONTAINED IN THIS APPENDIX ARE THOSE OF THE AUTHOR(S) AND ARE NOT NECESSARILY THE SAME AS THE CONCLUSIONS AND RECOMMENDATIONS OF THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD AS EXPRESSED IN THE SUMMARY REPORT AND THE TECHNICAL REPORT.

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COMPREHENSIVE REPORT

1. Recommendations

As a result of this study, recommendations are made concerning the hydro developments as they relate to recreational potential and development within the Outlet Lakes system.

1.1 Recreation

All recreational development in the area should be carried out in accordance with Master Plan II of this document.

Landing and boat launching approaches should be created at intervals of three miles along the navigation channels by clearing and grubbing strips 200 feet wide in areas where complete shoreline clearing is not carried out.

An environmental buffer of 1/2 of a mile should be maintained along the East Channel to preserve the semi-wilderness appeal of the canoe route.

Studies should be carried out on the feasibility of requiring all hunters in the area to use a guide. This would evenly distribute hunting pressure, prevent waste of game, and provide an economic return to the area from guiding fees.

At the Minago River crossing area, no further intrusions for gravel or construction materials should be made within one mile of the river banks, in order to preserve the recreation potential of the area.

Studies should be initiated to determine the feasibility of developing an historic site at Norway House to preserve a significant historic landmark; to develop a tourist based industry in the community; and as a means of ameliorating any social disbenefits which may occur as a result of the hydro-electric project.

Strict control should be carried out of hunting and fishing by construction crews to ensure that there is no undue harrassment of wildlife.

1.2 Bridges

All bridge approaches should be selectively cleared rather than completely cleared and widened as is the usual procedure.

The solid fill portions of the bridges should be kept to the limit of the existing bank and bridge spans should be used to span the natural channel width.

All culverts and bridge spans should be placed in sufficient number and at proper levels to maintain the natural flow of all water courses crossed.

1.3 Control Structures

A stop log structure should be incorporated in the Kiskitto Lake control structure, and water levels maintained to maximize benefits to wildlife and waterfowl.

Additional studies should be carried out on a possible control structure on Cross Lake on the channel as it leaves the lake. This should be done to maintain Cross Lake at an optimum level and to provide adequate levels for summer boating.

A flow of at least 10,000 cfs, during the summer months should be maintained on the East Channel to preserve the canoe route.

1.4 Borrow Pits

Borrow pits should be constructed so as to leave a treed buffer of 200 feet between the pit and the road.

Access to borrow pits should be limited to a single trail constructed at such an angle to the main road that the pit is not readily visible.

Where borrow pits are associated with river and lake shores, the pit should be constructed to leave a treed buffer of 1,000 feet between the pit and the shore.

1.5 Roads and Transmission Lines

A treed buffer of 200 feet should be maintained between roads and transmission lines.

Transmission line and road rights-of-way should be kept to the minimum width necessary.

Where transmission lines cross a river or road, a 100 foot treed buffer should be left between the towers and the road or river.

In the case of a roadway paralleling a river or lake, a minimum 500 foot treed buffer should be maintained between the road and any waterways. This condition should also apply to construction camps.

Clearing debris should be cleaned up along any routes likely to be used as public access such as the Jenpeg access road, and the Kiskitto Lake access road.

1.6 Dredge Spoil

Dredge spoil should be piled to form islands or berms rather than being piled in a ridge parallel to the channels.

The dredge spoil areas along the Eight Mile Channel should be reduced from the present 50 square miles.

Dykes and ponds should be constructed to aid in the settling and slow down of the runoff into the lakes.

The entrance to the Two Mile Channel should be riprapped to prevent erosion from wind set up on Lake Winnipeg.

The banks and backshore of the dredged channels should be planted as soon as possible to prevent erosion and improve the aesthetic appeal.

1.7 Clearing

The immediate Jenpeg forebay area, the Kiskittogisu side of the Whiskey Jack Portage and the Whiskey Jack Landing area should be cleared of all trees to elevation 715.

1.8 Site Clean Up

Following completion of construction, temporary camp buildings should be removed and all debris disposed.

All clearing debris, construction spoil and camp debris should be cleaned up before crews leave the area.

Cleared camp areas should be scarified and planted to grass.

2. Terms of Reference

The area to be studied by Parks Branch consists of the shoreline and associated backshore of the Outlet Lakes system. Parks Branch was required to assess the impact of water regime changes on identified recreation sites; to make recommendations to mitigate losses and enhance benefits to recreation derived from the hydro-electric developments; and to consider the feasibility of establishing such additional recreation opportunities as may be facilitated by the proposed developments.

Manitoba Hydro proposed to regulate Lake Winnipeg and to generate electrical power by means of facilities constructed on the West Channel Nelson River above Cross Lake. Later the feasibility of a control structure on the East Channel Nelson River at Sea River Falls was considered.

3. Objectives

Excepting the Canada Land Inventory data available, there was a void of information regarding the recreation potential of most of the study area. Thus, before any statements could be made with regard to the impact of water regime changes on recreation, a survey of the area to identify recreation sites had to be done. The first objective of this study was to conduct an inventory of potential outdoor recreation sites in the area. Following this the second objective was to determine what effects Hydro's proposals would have on each site. Once it was understood how each identified recreation site and, on a broader scale, how the entire recreational region would be affected by the hydro-electric developments the third objective could be applied. This was to make proposals, which if effected, would minimize damage and enhance the benefits to recreation within the region to be affected by the Manitoba Hydro proposals. The final objective of this study was to assist, along with the studies of other disciplines, in the formulation of a more informed and coordinated use of Manitoba's northern resources.

4. Study Area

The area to be studied was the Outlet Lakes system. This includes Playgreen and Little Playgreen Lakes, Kiskittogisu Lake, Kiskitto Lake, Nelson River West Channel, Cross Lake, Nelson River from Cross Lake to Sipiwesk Lake, Sipiwesk Lake and Nelson River from Sipiwesk to Split Lake. In August, 1972 it was decided that the East Channel Nelson River would also be included within the purview of the study. The Outlet Lakes area was studied with the above objectives in view, the results of this study making up the body of this report. Similar studies will be done on the Churchill River from Opachuandu Lake to Fidler Lake including Southern Indian Lake and the Rat and Burntwood Rivers.

5. Methodology

From November 1, 1971 to June 2, 1972 the preliminary in-office study was completed. Forest inventory maps were analysed to identify major areas of desirable vegetative cover. One planner was located in The Pas to contact resource personnel from the area. A review of literature pertaining to the study was made. Air photos and aerial mosaics were studied. This preliminary study provided the background data and regional overview necessary for the summer's field work.

During June, July, August and early September, 1972, two park planners surveyed the study area using Thompson as a base. The study area was divided into regional components according to access, physical integration and field time. Each regional segment of the study area was inventoried as a unit by aerial reconnaissance and ground survey. Areas having desirable foreshore characteristics, shoreline characteristics, backshore composition, scenic qualities and water body characteristics, were noted. Pertinent information was recorded on topographic maps, tapes, air photo mosaics and by colour slides. Other disciplines were contacted in the field, where possible. In August, 1972, it was decided to include the East Channel of the Nelson River within the purview of the study. This section of river was then surveyed by helicopter in early September.

In evaluating the recreation potential of each portion of the study area an inter-disciplinary approach was taken. This was facilitated by a seminar-workshop held by the Study Board staff October 17-18, 1972. At that time, each sector of the Board's study outlined its information requirements and a critical flowpath for study programming was developed.

Following this seminar-workshop, Parks Branch requested specific information from each discipline.

Wildlife and waterfowl data are requested from F. F. Slaney and Company Ltd., consultants for that sector. Transportation data with regard to present and proposed routes are requested from the transportation sector. Mines Branch, Manitoba Department of Mines, Resources and Environmental Management was requested to supply information regarding unique geological formations or developable mineral deposits in the area. Water level, rate of flow and peak flow data are requested from Water Resources Branch. Interpretation of Hydro data was also obtained from the Branch. Forestry Branch, Manitoba Department of Mines, Resources and Environmental Management, was contacted for timber berth information, and clearing program interpretations. Fisheries data are requested from Environment Canada, Fisheries Service, also a Study Board contract holder. Specific soils data are requested from the Soils Research Sector - The Department of Soil Science, University of Manitoba. Historical and archaeological data are requested from the Churchill Diversion Archaeological Project. The Physical Impact Study by the University of Manitoba, Department of Civil Engineering, provided general information on foreshore, shoreline and backshore characteristics. Water quality data are provided by the Environmental Protection Branch, Department of Mines, Resources and Environmental Management, Province of Manitoba. Demographic material was made available by the firm Acres Consulting Services. Additional agencies provided data for Parks Branch evaluations. Canada Land Inventory data are an important source of information as well.

Utilizing this information plus Parks Branch site evaluation data such as foreshore characteristics, shoreline characteristics, backshore composition, aesthetic characteristics and water body characteristics, macro areas having recreation potential were defined.

The suitability of an area for recreation, the type of recreation it is suited for, and the intensity of use it is capable of varies according to a combination of attributes and the quality of each attribute. These attributes are discussed below.

The prime recreation orientation will be directed to water use for power boating and canoeing. It is important that these activities can be carried out with a minimum of danger or hazard. Water bodies were then judged on the availability of sheltered coves, bays and channels, the absence of large areas of open water and the absence of a large number of shoals, submerged rocks and extensive weed growth.

An important consideration was the shoreline accessibility so that areas having sand beaches or approachable rock shorelines were preferred to areas with rubble shoreline or extensive mud flat and weed growth.

The quality of the backshore affects the type of use and the intensity of use to which an area is suited. For intensive use and backshore development a varied timber cover, adequate soil depth, and adequate drainage are required.

By using the existing forest inventory data and a system of classification¹ based on species composition, forest stands within each area were classified according to recreational potential. Enlarging on this

¹ Mazur, D., Parks Branch, Manitoba Department of Tourism, Recreation and Cultural Affairs, Personal Communication.

system, a forest stand is considered prime for recreation development if it is diverse in its species composition; has a prevalence of species which indicates desirable qualities such as good drainage and high tolerance to use; and if it is not overmature. For example, a pure stand of black spruce is usually undesirable since it is most often indicative of poor drainage, and has proven from past experience to be non-conducive to development because of its susceptibility to windfall. Information is also available on stand density and Crown closure conditions. Thus, prime recreation land on a micro scale can be pin pointed in the midst of a larger or macro site of many square miles.

Potential for sport fishing is an important concern for recreation in Northern Manitoba. According to the Norman Tourist Study, 69 percent of all visitors to Northern Manitoba engage in sport fishing. It may be speculated that this is one of the main reasons for visitors venturing north of the 52nd parallel.

Scenery and aesthetic quality are important weighting factors when considering the recreational potential of an area. These are important for several reasons. In the first place, it is assumed that persons seeking outdoor recreation prefer a scenic area. Thus areas of changing landscape relief; with irregular shoreline configuration; and with a diversity of backshore vegetation are considered to have more recreation potential than areas of continuous low relief; with very few shoreline indentations or changes in course; and with a monoculture timber cover. At the same time, it was assumed that any reduction in the aesthetic quality of an area decreased the recreational potential. Areas of lower

¹ McCloy, D.B., Norman Tourist Study, Department of Tourism, Recreation and Cultural Affairs, Research and Planning Branch, December, 1970.

recreation potential are extensively burned areas, flooded areas with dead timber standing or floating, and areas scarred by mechanical earth movers or tree clearing equipment. The scenic quality of an area thus enhances the enjoyment of other forms of recreation. From another viewpoint, just as attempts are made to preserve examples of unique or outstanding human history, ecosystems, or wildlife populations, so by identification and designation, an attempt is made to preserve outstanding or unique scenic areas.

The presence of wildlife or waterfowl enhances the recreation potential of an area. Various forms of wildlife based recreation exist, from consumptive forms such as hunting to non-consumptive uses such as photographing and viewing.

Access to an area is an important regional constraint when considering its recreational potential. If it is next to impossible or prohibitively expensive to reach an area, its potential is severely limited. Therefore, areas easily accessible by car or by boat from population centres held more innate potential than those that were very remote.

Thus, from the entire study area, macro areas having recreation potential could be identified. The next objective was to analyse the impact of Manitoba Hydro's proposals on those areas having recreation potential. It was originally proposed that micro areas be identified within the macro areas for field checks during the summer of 1973. This would facilitate projection of the impact of Hydro's proposals and recommendations for amelioration of losses or enhancement of benefits. However, the Outlet Lakes area was identified by the Study Board as a priority area with a final recreation statement due April 23, 1973. Therefore, this segment was analysed without this second

field inspection. Fortunately, this area had been covered well during the first field season and Canada Land Inventory data existed.

A dual master plan system is being used to prepare an impact statement on recreation in the Outlet Lakes region. Working within the guidelines and practicalities of existing Parks Branch policy, two recreation master plans were developed. Parks Branch policy for recreational development in Northern Manitoba is that if access is available to an area, and use is being made of the area, limited facilities will be provided if warranted. No access roads would, however, be developed solely to provide for a recreational experience, unless an intense need was demonstrated, or pressure was exerted. No intensive developments would be undertaken unless the designated area fills the requirement of providing a unique recreational experience. One master plan was developed for a situation assuming Manitoba Hydro's plans will be actualized. The other master plan was developed for a situation assuming no Manitoba Hydro development of this area. The two plans were then compared, the difference being credited as loss or gain to recreation due to the hydro-electricity scheme.

Estimates of visitor numbers were made by the Research and Statistics Branch, Manitoba Department of Tourism, Recreation and Cultural Affairs. These estimates served as guidelines to the park planners for phasing and intensity of development as well as supplying a quantifiable factor for decision makers involved with the entire hydro-electric scheme.

6. Observations

6.1 General Description of Study Segments

The following general description of the physical attributes of the study segments as regards recreational potential is based on field observations, an analysis of the existing Canada Land Inventory capability maps and information supplied by the other study components. The description contains a statement of the recreation potential of each area, and it is upon this potential that the recreation master plans for the Outlet Lakes system are based. A very complete physical description of the study area has been prepared by the University of Manitoba, Department of Civil Engineering.¹

6.1.1 East Channel and Little Playgreen Lake

The upper 30 miles of the East Channel of the Nelson River is bounded by marsh vegetation. The backshore is low with only minor relief, and extensive areas of muskeg and burn predominate. This area is not scenically inspiring; however, the lower reaches of this channel with more bedrock controlled shoreline, changing landscape and a greater diversity of backshore vegetation improve considerably. Access to the Hayes River System is possible via the Echimamish River which joins the Nelson at the High Rock. Below the High Rock, the channel divides into two main branches, each branch becoming braided as one proceeds downriver. Areas of fast water, rapids, and falls add much interest to this stretch of the river. The first major drop in Lake Winnipeg water level occurs at five foot Sea River Falls. Following the main, most often used route to the left

¹ University of Manitoba, Department of Civil Engineering, Physical Impact Study, interim report 1972, Characteristics of Churchill-Nelson Shorelines, summary 1972.

of the High Rock, the next drop is encountered at five foot Sugar Falls, then McCall Rapids, several small sets of rapids and then High Hill rapids with a nine foot drop. Pipestone Lake follows several miles down stream. Many small islands add further interest to the East Channel as well as offering excellent camp sites.

Canada Land Inventory lists several class three capability areas here meaning they are capable of supporting moderately high annual use, based on dispersed activities; these are generally associated with rapids or waterfalls.

According to the Fisheries - Limnology Report, "The fishery resource of the East Channel per se is entirely unknown, but might be considerable."¹ Working on this assumption, sport fishing on the East Channel could probably be quite productive.

Based on personal observation and the Wildlife Resource Impact Assessment² waterfowl would appear to exist in moderate numbers in Pipestone Lake and the lower reaches of the channel. Vegetation appears capable of supporting both moose and woodland caribou although densities of both are light. The Outlet Lakes region as a whole is capable of producing a harvest of 800 moose per year.³

¹ Koshinsky, G.D., Preliminary Report on the Limnology-Fisheries of the Lake Winnipeg Outlet Lakes Area: Present Conditions and Implications of Hydro-Electric Development. Fisheries Service. Environment Canada. Winnipeg. March 1973. p. 113.

² F. F. Slaney & Co. Ltd. Wildlife Resource Impact Assessment Lake Winnipeg Churchill and Nelson Rivers Hydro-Electric Projects: No. 1 - Outlet Lakes. Vancouver, March, 1973, p. 38.

³ Ibid. p. 26.

This area with its narrow, often shallow channels, circuitous routes, falls, rapids and areas of fast water, its oft changing scenery through areas of unspoiled wilderness not yet intruded upon by man made structures or obstacles would be well suited to wilderness canoeing.

Associated with this would be uses such as sport fishing, wildlife viewing and hunting. Access to the area is presently limited to airlift or cruise ship to Warren Landing.

At Norway House and in the vicinity of Norway House, very significant historic buildings still exist. These structures include a stone jail built in 1855, a powder magazine built in 1938, the Archway Warehouse with its "Franklin" sundial and "H.B.C. Ship Sea Horse" bell, dated 1782, the Bachelor's Hall of 1838, and the Council House. The exact positions of many other fur trade era buildings are marked by remaining foundations¹. The recreational and major historic site potential of Norway House is significant and offers many possibilities for development.

6.1.2 Playgreen Lake

Playgreen Lake is large, open and shallow. The shoreline is relatively inaccessible due to rocks and extensive weed beds. Due to the numerous shoals and hidden rocks which are almost invisible below the pea-green colour of the water, navigation even at the best of times is hazardous.

Some wide sand beaches exist especially on the northeast shore in the vicinity of Sandy Bar Point. These beaches are usually less than 20 feet wide and only six to 12 inches deep over clay. Commonly an

¹ Watson, Robert. "The Story of Norway House." The Canadian Geographical Journal. Vol. 1. No. 4. August 1930.



PLATE 1 - East Channel Nelson River - Much of the upper reach of this channel is typified by a marsh shore and a backshore of low relief.



PLATE 2 - East Channel Nelson River - Sections of fast water, rapids and falls such as five foot Sugar Falls add much interest to this river, increasing its value as a canoe route.

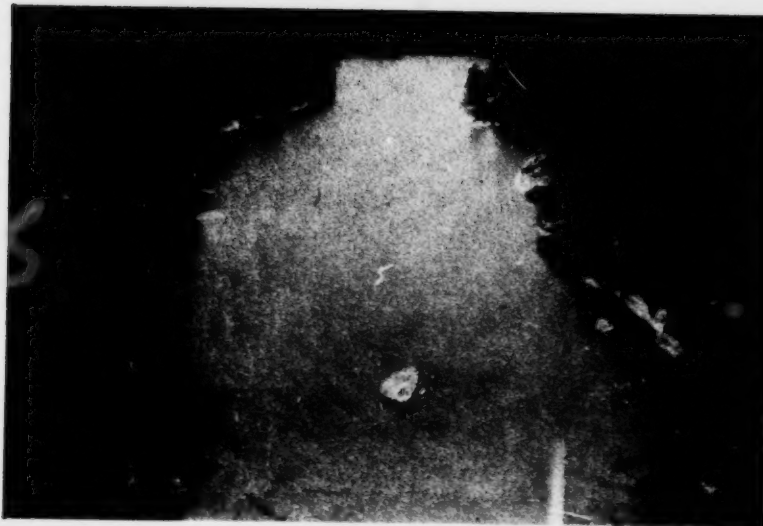


PLATE 3 - East Channel Nelson River - Lower reaches of this river channel are bedrock controlled with an oft changing landscape and a diversity of backshore vegetation.

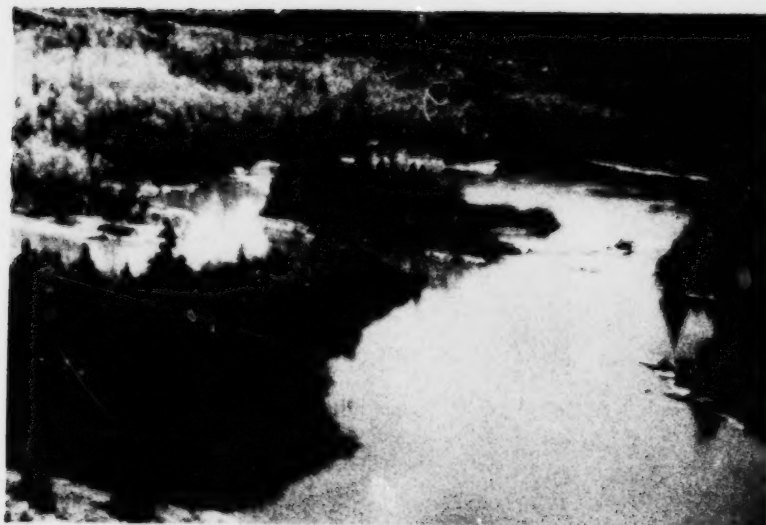


PLATE 4 - East Channel Nelson River - Well suited to canoe tripping, this river features a choice of several routes, varying channel direction and widths, and a variety of scenery.



PLATE 7 - Kiskitto Lake - With large areas of open water, this lake and Kiskittogisu Lake are unsuited to boating with small craft.



PLATE 8 - West Channel Nelson River - Kisipachewuk Rapids is one of three channels leaving Kiskittogisu Lake.

The scenery, because of the unchanging relief and regularity of the shoreline, becomes monotonous. Kiskittogisu is a good area for wildlife production and like Kiskitto Lake, its main value for recreational pursuits is in those based on wildlife. Access is limited to travel by boat or plane.

6.1.4. Kiskitto Lake

The backshore of Kiskitto Lake is of low relief, especially along the west end. The shoreline is composed of one half treed muskeg, one quarter fen, and the remainder is low bedrock shoreline, bedrock controlled shoreline with overburden beach and low shoreline formed in coarse sediments. The shoreline is very regular, composed of clays and silts eroded from the slumping backshore of treed muskeg.⁹ An extensive fen bog which extends several miles back from the shoreline, exists on the north side of the lake. The north-eastern part of the lake has a more irregular shoreline with more embayments and exposed smooth low bedrock peninsulas. Backshore areas are of low relief with a mixed vegetative bank of aspen and black spruce, backed by bog and fen. Some sand beaches occur in the bays. More often these bays support rush and pond weed growth backed by willow and alder.¹

Some commercial fishing is carried on. The catch consists of pickerel, goldeye and jack with an annual value of about \$10,000. Limitations to the production of fish would seem to be the shallowness of the lake and the extreme turbidity of the water.

The lake is shallow with frequent barely exposed rock shoals. Water quality is poor with a high sediment content. Scenery is not spectacular and can be quite monotonous. The shallowness of the lake

¹ University of Manitoba. Op. cit p. 76.



PLATE 5 - Kiskittogisu Lake - Slumping occurs as a natural process along much of the shoreline.



PLATE 6 - Kiskittogisu Lake - Extensive marsh shorelines are found along this lake.

offshore zone of weeds 50 to 200 feet wide exists while the beach and a narrow zone in shallow water offshore are typically without vegetation.¹

These beaches are classed as type 5 in the C.L.I. classification system. The remainder of the shoreline falls into classes 5 and 6 with some class 7 areas. These areas are generally suited to viewing wildlife and activities associated with nature study.

Due to these factors, recreational use of the lake will be limited, its main value being that of waterfowl production, some limited sport fishing, calving areas for caribou, and water access to Kiskitto and Kiskittogisu Lakes and the West Channel.

6.1.3 Kiskittogisu Lake

The southern half of the lake has low clay banks which have been subjected to severe slumping from the wave action of storms. The remainder of the lake shore is both clay and rock outcrop.

The backshore is composed of string bog, marsh and treed muskeg completely unsuited to any intensive recreational development. It is better suited to wildlife habitat and dispersed forms of recreation based on the wildlife resource.

Wildlife capability is similar to or slightly higher than Kiskitto Lake. Moose density is 0.5 moose or less per square mile.² Woodland caribou presently calve on the islands of Kiskittogisu.

Sport fishing potential is unknown, but Kiskittogisu ranks slightly higher than Kiskitto on the C.L.I. capability and may be similar to Cross Lake.

¹ University of Manitoba. Physical Impact Study: Characteristics of Churchill-Nelson Shorelines. Civil Engineering Department, University of Manitoba. Winnipeg 1973. p. 39.

² F. F. Slaney and Co. Ltd. Ibid.

combined with its expanse and lack of many sheltered areas makes it quite unsuitable for small shallow draft recreational boats, such as canoes.

This lake is an excellent waterfowl habitat. Moose densities in the area are estimated at .5 per square mile. Sport fishing could yield a high success rate with large catches of small sized fish. Recreational use will be based on the potential wildlife and fisheries.

6.1.5 West Channel Nelson River

Below Playgreen Lake and Kiskittogisu Lake at 710 feet above sea level, the three channels of West Channel Nelson River form one which discharges approximately 80,000 cubic feet of water per second into Cross Lake at elevation 679. The most westerly channel flows from Kiskittogisu Lake via Kisipachewuk Rapids, past Kiskitto Lake to Cross Lake, a distance of approximately 27 miles. It is joined at about the half-way point by waters from the Metchanais Rapids. Four miles further downstream the third channel, the Ominawin joins. The latter is the shortest route from Playgreen Lake to Cross Lake. The drop in elevation from 710 feet on Playgreen Lake to 679 on Cross Lake is accomplished in the main by changing gradient along the entire channel rather than a large drop at a single set of rapids or waterfalls. Thus, an ideal situation for whitewater canoeing through attractive shield topography exists on the fast water of the West Channel. The route from Kiskittogisu Lake to Cross Lake could be paddled in two days. At a more leisurely pace, extra days could be spent camping on any of the numerous islands along the way.

According to the C.L.I. recreation capability maps of the area, the lands adjacent to the West Channel of the Nelson River have the capability



PLATE 9 - West Channel Nelson River - Kisipachewuk Rapids is the starting point of the white water canoe route.



PLATE 10 - West Channel Nelson River - The route from Kiskittogisu Lake to Cross Lake can be paddled in two days. At a more leisurely pace extra days could be spent camping on any of the numerous islands along the channel.



PLATE 11 - West Channel Nelson River - A drop of about 30 feet in 27 miles over a continuous gradient rather than a single set of falls or rapids makes this an ideal white water canoe route.



PLATE 12 - Cross Lake - The eastern end of Cross Lake is shallow with extensive aquatic vegetation offshore. Access to the shore is poor.

to support outdoor recreation of a moderately low to very low intensity. Generally the area is suited to limited camping, wildlife viewing, canoeing, sport fishing, and photography. With the C.L.I. classification nearly all the lands fall into class 5-7 with some isolated class 3 and 4 lands at the rapids.

A density of less than 0.5 moose per square mile, common to much of Northern Manitoba, is estimated for this area. Caribou also exist in small localized herds. Fishing should be good at the numerous sets of rapids. The Nelson River channels appear to have the most attractive pike populations for sport fishing in this vicinity.¹ Large water birds such as blue herons and white pelicans, as well as gulls and terns, are commonly seen along the route.

Access is possible via the Lord Selkirk II, and Norway House across Playgreen Lake, or by plane to anywhere along the route.

The main value of the West Channel from a recreation standpoint is for white water canoeing, wilderness camping, hunting and fishing.

6.1.6 Cross Lake

Gross Lake is a rock bound lake; the entire shoreline north of the Cross Lake Indian Reserve is composed of rock backed by black spruce forest and muskeg. The northern half is of low relief and is backed by untreed muskeg and marsh and most small bays are weed choked.

Cross Lake is characterized by widespread marsh; long zones of bullrushes off protected shores, and extensive marshes across shallow bays.

¹ Koshinsky, Op. cit. p. 99.

3

Dominant shoreline type is 13 with types 15, 14, 11 in order of descending extent. Most of the remainder is types 24 and 28.

Type 13 is typically of low general relief, rising as much as ten feet in the first 100 feet from shore, but then levelling off. There is a tendency to form promontories or very irregular stretches of shoreline. Outcrops are as wide as 40 feet at the water's edge, and generally smooth surfaced from glacial scouring action. Small sand or cobble beaches are common, usually in small, protected indentations, and with an offshore zone of bullrushes. Overburden behind the shoreline outcrop is several feet thick, though there are scattered outcrops, and predominantly, on the western basins at least, of lacustrine clay, silt and fine sand.¹

The presence of many rocks, shoals and shallows makes boating hazardous. It is often difficult to attain access to the shoreline because of the shallow water extending long distances out from the shoreline exposing sharp rock and cobbles.

The southern areas below the reserve offer more potential for boating as there are islands and small bays, some having a small sand and sand-clay beach. This area also offers more interesting scenery with a varied timber cover and greater landscape relief. The area of the north end of Ross Island between the East and West channels and north of approximately 54 20', possesses superior recreational capabilities. The forest cover is a mixed stand on well-drained soils suited to camping. The shoreline configuration features areas of protected water for small craft boating and high aesthetic quality.

¹ University of Manitoba Op. cit. p. 82

Sand beaches are frequent and provide easy boat access and camping spots.

The east end of Cross Lake is a significant area for diving ducks, as large numbers were observed.¹ The west end of the lake between the Minago River and the Reserve has extensive wildlife marsh habitat. It is a good waterfowl breeding and an important staging area. There is thus, potential for waterfowl hunting and viewing. The extreme west end of Cross Lake around the mouth of the Minago River has potential for more intensive forms of recreation. The vegetative cover, drainage and soil depth are suited to development of the backshore. Several small beaches exist in this area. This vicinity has better than average capabilities for moose and waterfowl production.

Canada Land Inventory maps denote good areas with limited development potential along the southeast and southwest shores and near the mouth of the Minago River. These areas are classed by C.L.I. as class 4 through 6 with one isolated class 3 area. They possess a moderate to low capability for outdoor recreation, they are suited to limited extensive recreation use based on dispersed activities such as hunting, fishing, wildlife viewing, boating, photography.

Commercial fishing is carried out on the lake, and sport fishing produces high success rates, yielding large numbers of small two to three pound jackfish.

Vehicular access is possible as far as the Nelson River West Channel. An all-weather road has been built from P.R. 373, to serve the construction of the Hydro dam at Jenpeg. There is no accommodation available in the settlement.

¹ F. F. Slaney & Co. Ltd. Op. cit. p. 42.

6.1.7 Minago River

An excellent site for camping and boating exists on the Minago River as it empties into Cross Lake. The site displays not only good developable land, but other essential attributes such as good water access, gentle slopes and scenic views.

Here a large stand of aspen and white spruce on a gently sloping well drained site, offers good cover for camping and associated uses. Soil cover seems ample to support continued use with a minimum of damage. In the general vicinity on the south bank of the river, upstream toward Drunken Lake and on Cross Lake, several smaller attractive sites can be found.

The prime areas are classed as 4 by C.L.I. These lands have a natural capability to engender and sustain moderate total annual use based usually on dispersed activities. These areas are suited to activities such as organized camping, viewing wildlife, fishing, hunting and boating.

Access to the area was limited to boat travel from Cross Lake or float plane. However, the road to Jenpeg has opened the area to use by hunters, fisherman and boaters.

6.1.8 Nelson River - Cross Lake to Sipiwesk Lake

The lower reaches of this channel are similar to Sipiwesk Lake in that the shoreline is flooded and bounded by dead standing timber, making access to the shore difficult. The upper and central reaches are similar to Cross Lake, having relatively steep bare rock shore. Large areas have been burned over and are covered with a re-growth of young aspen with the typical black spruce growth on the wetter clays and bogs. There are isolated localized stands of good timber which

have escaped the fires but alone this does not give the area any outstanding recreational significance with respect to vegetation. The central area has a better than average scenic quality with varied landscape, but is rendered inaccessible by the treacherous nature of the river. Leaving Cross Lake via an east channel, Ebb and Flow Rapids, with a ten foot drop, is the first un-navigable water encountered. Via a west channel an unnamed series of rapids is first encountered followed by Eves rapids. Along this route another channel headed by Eves Falls is by-passed and another set of unnamed rapids is met. The two channels converge at 30 foot Whitemud Falls. Six miles further downstream, after the river twice reverses its course, there is an 11 foot drop at Bladder Rapids. There is again a choice of channels around Bear Island. To the east side, Hill Rapids with a ten foot drop is the first met, followed by Redrock Rapids, Chain of Rocks Rapids, and then Sipiwesk Lake. To the west side is Little Manitou Rapids, then an unnamed set of rapids, followed by Duck Lake. One more set of rapids separates Duck Lake from Sipiwesk Lake. Approximately 30 miles of river and an approximate drop of 70 feet in elevation, separates Cross and Sipiwesk Lakes by either channel. Only the most experienced boatman should attempt to travel from Cross Lake to Sipiwesk Lake. Travelling upstream from Sipiwesk Lake to Cross Lake is an arduous task due to the swiftness of the water and the difficulty of the portages.

With regrowth of timber and with vehicular accessibility, the lower reaches of this river near Duck Lake could become useful as a recreation area. This may be plausible and demand may warrant its use twenty-five years hence. Viewing of the more spectacular rapids would attract visitors. Camping and boating in the Duck Lake, Bear Island region would also be feasible.

6.1.9 Sipiwesk Lake

This lake is within the influence of the Kelsey hydroelectric dam. Flooded timber below full supply level has left all but the most acutely sloping shorelines inaccessible from the water. This not only prohibits water based shoreline associated recreation use; it also increases considerably the hazards of boating, thereby removing the possibility of taking shelter on shore should storms arise. The tangle of dead, falling and floating timber, and in many places slumping shoreline, cancel any aesthetic appeal which the diversity of vegetation and relief; the changing shoreline configuration; and the abundance of islands may have created.

Vehicular access to Sipiwesk Lake is provided by Provincial Road #373 from #391. Although no visitor-use records have been kept, evidence in the form of neatly piled camping refuse; the presence of foreign licensed camper trucks, and boat trailers; and conversation with area residents, attest that Sipiwesk Lake is being used for sport fishing. Accessible by boat from the lake are the rapids on the Nelson River upstream from Sipiwesk. Walleye fishing here supplements the northern pike fishery on the lake. The Parks Branch is in the process of developing a wayside at the end of the road to serve the fishermen using Sipiwesk Lake.

6.1.10 Nelson River from Sipiwesk Lake to Kelsey

Aesthetically, this reach of the Nelson River has no qualities which would contribute to its recreation potential. The water is an unattractive gray green of high sediment content. Seldom veering from the most direct route from Sipiwesk to Split Lake, the course of this river offers little interest in the form of change of direction.



PLATE 13 - Sipiwesk Lake - Its many islands and irregular shoreline create a quality which gives this lake its Cree name meaning Lake of Many Vistas. Now under the influence of the Kelsey Dam it is surrounded by a ring of dead vegetation which destroys any aesthetic appeal it may have held.



PLATE 14 - Nelson River between Sipiwesk Lake and Kelsey Dam - Also within the influence of this hydro electric generating station, this river and its associated flooded shoreline have little recreation potential.

Factors such as swift flowing current and sets of rapids which would also add to the interest and excitement of a river, are non-existent. It is no longer a river from this point of view, but rather a reservoir about 75 miles long and 1/4 mile wide, in the forebay of the Kelsey hydro-electric dam. All low lying shore areas have been flooded and are now fringed with a band of dead, standing and falling timber, a tangle of weeds and floating debris. The only areas not affected are those of rock outcrop which are in most cases steep and inaccessible. As well, a great deal of the area has been burned over in the last five or ten years and is now covered with a sparse growth of aspen mixed with black spruce.

The lack of attractive scenery, points of interest, available campsites, and sheltered bays, added to the presence of hazards such as inaccessible shoreline, and floating debris, render this area unsuited to recreational boating.

Despite severe resource limitations as those just discussed, reasonable access to an area will often generate recreational use. Presently there is no vehicular access to this area. The Canadian National Railway crosses the Nelson at Arnott. The only other means of access would be via a long boat trip or by aircraft. The rewards are not sufficient to warrant use of train, boat or plane for access. Therefore, it can be stated that this area has little recreation potential.

6.2 Areas Selected for Master Plan Development

No area is without recreation potential of some kind. It remains for the planner to decide on the relative values of each area and to produce a realistic practical plan which will maximize this potential

and make it available for the enjoyment and edification of the vacationing public. Constraints such as accessibility and demand must be heeded when proposing development if the plan is to remain practical.

Considering all resources and constraints, a practical plan is evolved for development and use of the most valuable area. This does not presume that the other areas have no potential and that no recreation use will be made of them. No encouragement would be given for use of such areas, however. All developments or promotions would be directed to the most valuable area. At the same time, it should be noted that in certain cases such as unique ecological or wilderness areas high use would not be desirable.

After reviewing the merits of each segment of the Outlet Lakes region, several prime areas having higher recreation potential become apparent. Now attention can be focussed on these areas in particular and a comprehensive recreation master plan can be developed within the parameters of Parks Branch Policy. These areas would include the waters and associated shorelines of the East Channel; West Channel; Pipestone Lake and the south-west end of Cross Lake; the mouth of the Minago River; and the immediate areas of Cross Lake and Norway House settlements.

These areas do not have the resources necessary to sustain high annual use by vacationers for intensive types of recreation. They are best suited to more extensive short term uses such as whitewater canoeing, wilderness canoeing, and camping, hunting, fishing, and to a limited extent, power boating. The intent over most of the area is to preserve the wilderness aspect, therefore, high annual intensive use is not desirable.

6.3 Outdoor Recreation Master Plan I - Without Hydro Developments

6.3.1 Conceptual Plan:¹

This plan will consider the existing Jenpeg to P.R. 391 road as part of the Hydro development and therefore as non-existent at this time. It will be assumed however,² that this road would eventually be constructed to connect Cross Lake and Norway House to P.R. 391 via the same route as the present Jenpeg to P.R. 391 road, branching south-east to Norway House, crossing the East Channel at Sea River Falls, and north-east to Cross Lake settlements. It will be further assumed³ that this road would be a reality ten years hence, i.e. 1983.

The Nelson River from Sipiwesk Lake to Kelsey has very limited recreation potential because of its size, the flooded condition and the inaccessibility of its shoreline. Some possibility exists for boating and wildlife viewing but many superior areas exist within the system.

Sipiwesk Lake has already been adversely affected by the Kelsey project and is rimmed with a sixty to seventy yard band of dead trees. The lake is accessible via P.R. 373 and fishing remains good in spite of the flooding, so a small access campground should be provided to serve fishermen who use the lake.

¹ Conceptual Plan and Development Plan

The conceptual plan is the use, determined by reasoned professional judgements, that an area can sustain and the development plan is those facilities necessary to provide the recreational experience visualized in the conceptual format. The intelligent use of this system produces a plan which makes the best use of the available resources to produce a rewarding recreational experience while maintaining the environment.

² Rosin, K.A. et al. Outlet Lakes Transportation and Navigation Study. University of Manitoba. Winnipeg, January 1973. p. 23.

³ Ibid.

At the present time there is recreation potential in the form of canoe tripping on the east and west channels of the Nelson River. The west channel provides an opportunity for white water canoeing through an island-studded channel which is bounded by rock shoreline and scenic backshore areas typical of its Canadian Shield topography. Approximately one fifth of the flow of the Nelson River passes along the 50 mile East Channel. It offers several route choices through its multi-channeled course, plus a variety of scenery from reed lined shores and calm water to granite shoreline and fast water, including rapids and falls. Various routes are possible, but a notable asset of this portion of the Nelson River System, is that it offers a circular canoe route -- an attribute lacking in the majority of Northern Manitoba canoe routes. Also, the East Channel from Norway House and up the Echimamish River, forms the beginning of the historic fur trade route via the Hayes River to York Factory on Hudson Bay.

Access to this area is possible via several modes. One possibility is the transfer of personnel and equipment from Selkirk to Norway House and return via Cruise Ship Lord Selkirk II. Another method would be to ship the equipment by this route and to fly in personnel. Larger planes could also be chartered to transport boats, men, and equipment. Many canoeists would however, probably prefer to rent canoes from The Bay, and return them via the circle route or leave them at Cross Lake and fly out via scheduled flights. Thus, canoe routes could be established on the East and West Channels of the Nelson River between Norway House and Cross Lake. Highway access to the East Channel and Norway House would result in greater use of these canoe routes.

A limited highly fluctuating and seasonal market could exist for guiding services. This would not be dependable, for use of the canoe

route would probably not be intensive.

The scenic requirements of a lodge could be met in the embayment area on the south part of Cross Lake towards Whiskey Jack Portage. This area would also provide more shelter than the large open areas of Cross, Playgreen, Kiskitto, Kiskittogisu and Sipiwesk Lakes.

Access by water or road to Kiskitto Lake or by water to the east end of Cross Lake for hunting and fishing could require the establishment of small primitive camping areas, picnic areas, and possibly a motel at Cross Lake.

Eventual road access to Cross Lake and Norway House settlements via Wabowden, would open the area to hunters, fishermen and sight-seers. This would necessitate a campground on the Minago River, and waysides with primitive facilities at Whiskey Jack Portage and Sea River Falls and possibly the West Channel Nelson River crossing. Boat launch ramps would also be required.

Road access to Norway House would enable vehicular bound tourists to visit an historically rich area which prior to this, would have been economically and logistically untenable. An historic site in the order of the magnitude of Lower Fort Garry could be developed. The influx of visitors to this site would require the establishment of a transient campground at Norway House, and the expansion of existing accommodation facilities.

6.3.2 Development Plan

6.3.2.1 Sipiwesk Lake to Kelsey

Any recreation developments on the Nelson River from Sipiwesk Lake to Kelsey have been ruled out due to its extremely limited capability and potential.

Fishing presently attracts some use and since the lake is accessible via P.R. 373, a small access campground is planned at the end of the road to serve fisherman. No additional recreational use is foreseen for Sipiwesk Lake, as it would require extensive clearing and clean-up operations.

6.3.2.2 Cross Lake

Cross Lake east of the settlement is unsuited to intensive recreation. Hunting and fishing could, however, be supported. Motel accommodation at Cross Lake settlement will be required to serve this and other uses.

6.3.2.3 West Channel

There is presently recreation potential in the form of canoe tripping on the east and west channels of the Nelson River. The West Channel provides an opportunity for white water canoeing through an island-studded channel which is bounded by rock shorelines and scenic backshore areas typical of its Precambrian Shield topography. To preserve this potential, a 500 foot environmental buffer should be placed along the shoreline to prevent the intrusion of roads, forestry operations and mining close to the shore.

6.3.2.4 East Channel

The slower flowing East Channel is a longer stretch of river than the West Channel. It offers several route choices through its multi-channeled course. This route features an oft changing river width, numerous sets of rapids and waterfalls and a varied shoreline from steep lichen covered rocks, to reed-choked shallows. The shoreline and backshore vegetation from Norway House to Sugar Falls is generally

black spruce muskeg which has been extensively burned over. Down river drainage improves and the vegetation consists of white spruce, aspen, jack pine and black spruce in various mixed stands.

This portion of the Nelson River System offers a circular canoe route. The trip would be started from Norway House across Playgreen Lake, down the West Channel and then over to the East Channel via Cross Lake and Pipestone Lake back to Norway House up the East Channel.

As an alternative to paddling up the East Channel a 3.8 mile portage at Whiskey Jack portage from Cross Lake to Playgreen and Kiskittogisu Lakes could be used. The route is still used for freight transfer, thus vehicular transfer would be possible for those wishing to ply the open waters on Playgreen Lake rather than the East Channel. A boat ramp and small campground should be provided on this portage.

The reverse route would also be a rewarding trip. Canoeists wishing to take the trip from Norway House down the East Channel could then return to Norway House via Whiskey Jack Portage and Playgreen Lake. Paddling up the West Channel would be a next to impossible task, due to the numerous rapids and stretches of fast water that exist at the present time.

Canoeists wishing to experience only the white water of the West Channel could be airlifted or take a motor launch to Kisipachewuk Rapids where the West Channel leaves Kiskittogisu Lake.

The portion of the East Channel from Norway House to the "High Rock" would be the first leg of a trip retracing the historic fur trade route from Norway House to York Factory via the Nelson, Echamamish and Hayes Rivers. Federal Government interest¹ in this area has been indicated and the establishment of a National Historic Waterway should be encouraged.

6.3.2.5 Ross Island

The Outlet Lakes area generally does not offer the type of outstanding scenery, hunting or fishing to support the establishment of a commercial fly-in lodge operation. The scenic requirements of a lodge could be met in the embayment area on the south part of Cross Lake towards Whiskey Jack Portage. This area would also provide more shelter than the large open lake areas. Canada Land Inventory capability maps indicate high quality ungulate habitat to the west of here, but preliminary population counts² indicate a density of less than 0.5 moose per square mile. Fishing in the area has yet to be proven to be outstanding. For a high quality fly-in lodge to be successful in this region such would have to be the case.

Generally in such remote areas in this general situation, a sport fishery must meet one or more of the following criteria to attract significant participation:

- (a) Provide lake trout with good catch per unit effort and/or trophy sizes.
- (b) Provide northern pike at trophy sizes.
- (c) Provide walleye with exceptional catch per unit effort.
- (d) Provide good alternative activity options.

According to the fisheries-limnology report, the first condition cannot be met as lake trout do not inhabit these waters. The second condition is very difficult to meet in these type of lakes where commercial and domestic gillnet fisheries take place. The third might be met in Drunken Lake. However, the presence of walleyes does not

¹ National and Historic Parks Branch. Byways and Special Places. Indian Affairs and Northern Development. Ottawa, 1973. p. 27.

² F. F. Slaney & Co. Ltd., op. cit. p. 23.

guarantee angling success. The fourth might be met by the hydro developments and the building of access roads. It is unlikely that other species such as sauger, yellow perch, goldeye, whitefish or sturgeon will exert much influence on sport fishing development in the region.¹

Commercial fishing does occur on Playgreen, Cross and Kiskitto Lakes and net fishing for local use is conducted around Cross Lake settlement, Norway House and Rossville. Many more appropriate fly-in lodge locations exist elsewhere in the province.² Successful lodges are on Molson Lake and Washahigan Lake to the east of the study area.

A lodge in this embayment area of Ross Island directly south of Cross Lake settlement would enjoy isolation until road access was gained, then use of the area by non-lodge recreationists would diminish the satisfaction of lodge users and degrade the quality of operation possible on a fly-in only lake. The lodge would be drawn into a concession stand-outfitter type of operation once vehicular access is possible. The level of use would not, however, be of sufficient magnitude to support this type of operation. Any commercial operation would be encouraged to develop in Cross Lake settlement. Here a motel type operation on a year round basis to serve the lack of local accommodation for persons coming to Cross Lake on government and private business could be supplemented by a seasonal tourist trade in lodging, guiding and outfitting.

¹ Koshinsky, G. D. op. cit. pp. 68 and 69.

² Personal communication with R. Bridge, Supervisor of Tourist Development, Manitoba Department of Tourism, Recreation and Cultural Affairs.

The northern half of Ross Island, especially the shoreline areas around Cross and Pipestone Lakes and along the East and West Channels possess higher recreation potential than most of the region. For this reason and to preserve the integrity of the canoe routes, an environmental corridor of 500 feet should be established along both shorelines of these waters. This would preclude roads paralleling the shoreline and logging to the shoreline.

Eventual road access to Cross Lake and Norway House from P.R. 391 via an extension of P.R. 373 would make available the high quality camping areas on the Minago River as it enters Cross Lake. This site is an ideal area for a stop over campground having good access, adequate soil cover, good drainage and mixed vegetation cover. This campground would provide a start-off point for hunters heading up the Minago River for moose or to the marsh areas in that vicinity for waterfowl. It would also serve as a stop over point for fishermen, campers and persons travelling to Cross Lake settlement or Norway House.

Wayside parks with boat launches should be constructed at the Nelson River (West Channel) crossing and at Sea River Falls crossing on the East Channel. A campground and boat launch ramp at Whiskey Jack Portage would be required in 15 to 20 years to accommodate recreationists using that area of Cross Lake.

6.3.2.6 Norway House

Road access to Norway House will enable tourists to visit an historically significant area. At Norway House, the potential for developing an historic site complex is enormous. Existing structures include a stone jail built in 1855, a powder magazine built in 1838, the Archway Warehouse with its "Franklin" sundial and "H.B.C. Ship Sea

Horse" bell, dated 1782, the Bachelor's Hall of 1838, and the Council House. The exact positions of many other fur trade era buildings are marked by remaining foundations.¹ Preservation and restoration of these buildings for history's sake is of paramount importance. In addition, promotion of these sites could be successful and also economically rewarding once the Norway House road was built. Visitor attraction to the Cross Lake - Norway House region will be greatly increased with the development of such a significant historic landmark.

A new transient campground would be required in the Norway House area to accommodate this expected influx of visitors. Other visitor orientated services such as a motel, gas and service station, camping supply centre and souvenir sales would also be required by visitors to a developed historic site complex. Guiding and outfitting services would also be in greater demand, for once the recreational base was diversified with the addition of an historic site complex, canoeing, hunting and fishing would also increase.

6.3.3 Phasing of Development Program

1973 - 1977

Canoe route West Channel

Canoe route East Channel

Circle canoe route

Designation of environment corridors East and West Channels.

1978 - 1982

Hotel-motel at Cross Lake

Outfitter-guiding service at Cross Lake

¹ Watson, Ibid.

1983 - 1987 (or following completion of the road to Norway House)

Campground, boat launch Minago River

Wayside, boat launch east bank Nelson River (West Channel)

Wayside, boat launch Sea River Falls

Historic Site Norway House

Campground Norway House

Outfitter-guiding service at Norway House

1988 - 1992

Expand existing campgrounds

Campground, boat ramp Whiskey Jack Portage

Historic Site Norway House

6.3.4 Demand

The total number of visitor days spent in the Norman region in 1970 was 1,001,389. Of this number, 2.7 per cent or 27,038 were spent in the Wekusko Lake subregion and the visitors spent a total of \$169,528. This was based on an average stay of 5.74 days and an expenditure of \$6.27 per person per day.

Assuming that there would be no road access to the Outlet Lakes area until at least 1984 and based on a ten percent increase in tourism per year from 1974, we arrive at a figure of 1435 parties visiting the area during the first year the road is completed. Projecting these figures to 1992, we arrive at the following total number of parties (3.5 persons) using the Jenpeg area.

<u>Year</u>	<u>Total Parties</u>
1984	1435
1985	1935
1986	2435
1987	2535
1988	2660
1989	2790
1990	2925
1991	3065
1992	3215

Applying the same figures to this condition, in 1984 when the road is completed to Cross Lake and Norway House, some 29,406 visitor days could be spent in the Outlet Lakes area. Assuming an inflation factor, approximately \$10 per day per person would be spent. This could inject approximately \$294,060 into the regional economy.

The use of any canoe routes in the area would be minimal with perhaps 20 parties initially per year, while canoe tripping around Ross Island on the circle route could be two to three percent of the total parties visiting the region.

Use of the area for recreational fishing would be perhaps 50 percent of the total estimated parties, while only five to ten percent of the number fishing would use the area for hunting.

Visitation to Norway House and an historic site there would be about 20 to 25 percent of the total visiting Jenpeg.

6.4 Outdoor Recreation Master Plan II - With Hydro Developments

6.4.1 Introduction:

In Plan 1, a twenty year outdoor recreational plan has been proposed for the area bounded by the East and West Channels of the Nelson River. This plan took under consideration the existing resources, normal growth of recreation demand in Manitoba, and the normal use of canoe routes in Northern Manitoba. No disruptive external forces such as hydro electric development were considered as they were to be dealt with in Plan II.

By 1975, Manitoba Hydro's plans for regulation of Lake Winnipeg should be complete. An all weather road linking Jenpeg on the lower West Channel of the Nelson River to Provincial Trunk Highway 391 has been built. A temporary earth fill and barge crossing is in place at the mouth of the Minago River to be replaced by a permanent span bridge.

The control dam and generating facilities will be in place at Jenpeg. Channel modifications consisting of a two mile dredged channel joining Lake Winnipeg to Playgreen Lake west of Warren Landing; an eight mile dredged channel joining Playgreen Lake to the south end of Kiskittogisu Lake; blasting to deepen Kisipachewuk and Metchanais Channels; and a two mile by-pass constructed to the south of Ominawin Rapids should be complete. Most of the work will be coordinated from a 2000 man work camp constructed on the west bank of the Nelson River (West Channel) at Jenpeg. Access roads to Kiskitto Lake and Whiskey Jack Narrows will be constructed. Smaller construction camps will be built at the various work areas. Assorted dyking will be constructed along the West Channel as necessary. Under regulation water levels at the north end of Playgreen Lake will be 714.9 feet maximum and 707.0 feet minimum.

Within the plans for regulation of Lake Winnipeg from Jenpeg, three alternatives existed as regards flow down the East Channel. These were: (a) regulation of Lake Winnipeg with unregulated flow down the East Channel; (b) control of the East Channel by a structure at Sea River Falls releasing flows at a to be negotiated rate; (c) completely shutting off all flow by means of the above structure, thus maximizing the benefits to power generation at Jenpeg. This recreation master plan is developed assuming condition (b) will be followed with adequate summer flows released to allow canoeing below the structure. It is further assumed that the structure will be built by means of an access road constructed from Jenpeg. It is speculated that this road would be extended to Norway House using the Sea River Falls control structure as the East Channel crossing. The control structure will likely be built directly over the falls.

Present indications, from Manitoba Hydro are that the Jenpeg airstrip would be maintained and that the site would be serviced by air. Thus existing roadways would be of no further use to Manitoba Hydro, meaning abandonment of the roads. As well the earth fill bridge crossing over the Minago if not maintained would fall into disrepair and would soon become unusable. The onus would thus appear to fall on the Province of Manitoba, Department of Highways if these roads and bridge crossings are to be maintained following completion of the hydro-electric structures. Political considerations and local pressure would seem to dictate that the province take over these roads and eventually extend them to both Cross Lake and Norway House. It is on this premise that this recreation master plan is based. The possibility that this will not be the case does, however, exist and the recreation situation as it would exist in such a case will also be discussed.

6.4.2 Conceptual Plan

Studying the available recreational potential of the area in light of Manitoba Hydro's plans for development has necessitated dividing the area into smaller interrelated systems. Each of these smaller systems is suited by reasons of resources, cultural or historical significance to varying intensities of recreational use and development. These are discussed below.

6.4.2.1 West Channel Area

The power dam at Jenpeg will undoubtedly act as a visitor magnet, drawing people into the area. As the subject of much controversy it has already received much publicity. It is expected that fishing in the tail race of the dam will be inviting.¹ Sport fishing is also

¹ Koshinsky, op. cit. p. 108.

likely in the forebay area of the dam. Therefore it will be necessary to clear the forebay area to at least full supply level to remove the hazard and hinderance of drowned standing and falling timber, submerged snags and "sweepers". This will also enhance the aesthetic quality of an area which is likely to come under heavy use.

Those visiting the dam will probably stop over for fishing and a rest or picnic before continuing or returning. Thus the need for picnic and wayside facilities near the dam exists. As well, a percentage of those visiting the Jenpeg site will want to camp in the immediate vicinity of the dam.

One desirable area for a campground exists to the south of the Jenpeg construction campsite. This area would have water access to the Nelson River. Over half of the area will be flooded necessitating clearing, stumping, and grubbing if the site is to be usable, and access to the Nelson River for boating is to be maintained.

Another site exists north of this area. This is on the east bank opposite the dam site. A campground and a picnic area could be developed in this area, and water access for boat launching would be provided if clearing the immediate forebay as mentioned above, was carried out.

The existing cleared areas presently used for work areas and camp areas at the dam site if cleaned up and replanted could create attractive open areas in the vicinity of the dam. Once temporary buildings were removed and construction debris eliminated, open areas could be scarified, and seeded to a grass such as brome. If late fall seeding was accompanied by a heavy application of fertilizer, grass would grow even on the scoured clay subsoil. Such treatment would provide more immediate softening of the construction scars then would replanting forest cover. Natural regeneration would occur around the edges of the open areas and would gradually replace



PLATE 15 - Jenpeg Dam - This dam is being constructed at the mouth of the Nelson River West Channel at Cross Lake. The cleared areas are construction camp work and accommodation areas, roads and an airstrip.



PLATE 16 - Minago River Crossing - Extension from Provincial Road 373 to Jenpeg crosses the Minago River near its mouth. The area is a desirable camping area because of its location and natural resources.

the grass. A thorough job of timber clearing in the forebay of the dam accompanied by planting of the open areas would enhance the entire Jenpeg dam site.

These open areas are already attainable by access roads. By providing minimal services such as pit privies and possibly firepits and tables, the immediate requirements of those wishing to camp or picnic in this area could be met.

6.4.2.2. Minago River

An excellent site for camping and boating exists on the Minago River as it empties into Cross Lake. This site is close enough to serve as a campground both for those persons interested in seeing the dam, and those hunting and fishing up the Minago River. The site displays not only good developable land, but also other essential attributes, such as good water access, gentle slopes and scenic views. On the north bank, a large stand of aspen and white spruce on a well-drained site, offers good cover for camping and associated uses. Soil cover seems ample to support continued use with a minimum of damage. Several smaller attractive sites exist further upstream.

Construction of the Minago River crossing left a clearing of approximately four acres on the north side of the crossing. Use is already made of this area for boat launching and parking camper trailers. This open space could be treated in the same manner as described for the Jenpeg site open areas. Minimal facilities at this site would also serve immediate needs.

Whether or not the Minago River will still remain navigable is not known. Much would depend on the actual flows coming down the Minago. If the Minago river to Drunken Lake is simply an estuary of Cross Lake, with little of its capacity attributed to its own flow, drops of six feet would probably prohibit travel upstream to desirable hunting areas.



PLATE 17 - Jacob Scatch (left) and Sandy Monias, return to Cross Lake Settlement after a successful moose hunt up the Minago River. This area will, it is predicted, sustain much higher hunting pressure once outside hunters can reach the mouth of the Minago River by road.



PLATE 18 - Cross Lake end of Whiskey Jack Portage - This is the route used to transfer freight from Playgreen Lake to Cross Lake by truck for barge transport to Cross Lake Settlement.

Hydro estimates¹ of peak flows of 500 c.f.s. for fall floods were made at the time when the road crossing culverts were designed. Difficulties were encountered when placing these culverts in that a bedrock bar prohibited placing the culverts at greater depth. Water levels in the Minago River would likely be directly related to levels on Cross Lake.

6.4.2.3 Kiskitto Lake

Kiskitto Lake will be accessible via the construction road from Jenpeg to the control dam at its mouth. This area possesses limited recreation potential. Fishing will probably be fairly successful yielding large numbers of two or three pound pike. Stabilized water levels on the lake could double or triple its productive capacity.² Hunting in this area both for waterfowl and moose has good potential. Once the dam was reached boats could be launched and travel from there. This lake is close enough to Jenpeg to serve as a satellite recreation area for short term visits. Main shore and islands in the narrow section of Kiskitto Lake are capable of supporting primitive camping. Such areas could be reached by boat after launching at the dam site itself.

6.4.2.4 Ross Island

The north end of this island along the shores of Cross Lake and Pipestone Lake offers wilderness camping, fishing and hunting opportunities. Access could be attained by boat from Cross Lake settlement.

¹ Personal Communication with Mr. D. G. Ramsay, then Project Planning Engineer, Water Resources Division, Manitoba Department of Mines, Resources and Environmental Management.

² Koshinsky op. cit. p. 111.



PLATE 19 - High rock face west end of Cross Lake - This is indicative of some of the scenery at this end of the lake.



PLATE 20 - Sand beaches with good backshore west end of Cross Lake - Indicates the recreation potential of the west end of Cross Lake.

This would also be possible for visitors if the road was completed from Jenpeg to the settlement. Prior to construction of the road, visitors could still reach the area by boat from Jenpeg or the Minago River crossing. If the road was continued to Sea River Falls, access to this area could easily be attained at Whiskey Jack Portage. This is already possible by travelling on the Manitoba Hydro service road to a construction camp at Whiskey Jack Narrows. Parts of this road are, however, below the full supply level for the Jenpeg dam.

Boating on Pipestone Lake and the southern portion of Cross Lake bordering Ross Island and Cross Lake settlement and around to the Minago River could be seriously hampered. Drops in water levels of as much as 2.85 feet during August are possible under regulated conditions. An accumulated drop of four to six feet is possible over the summer months. The mean depth of Cross Lake is calculated as ten feet. Water too shallow for navigation would likely be encountered. As well some delta areas near the mouth of the West Channel could dry up completely. Shoals which were previously not a problem to navigation will become hazards yet to be identified.

6.4.2.5 East Channel

Either the Sea River Falls area or the Norway House area could serve as starting points for canoe trips on the East Channel. Various routes are possible including a trip down the Hayes River system via the Echimamish River and circular routes back up the West Channel or through Playgreen Lake. The route below Sea River Falls is an excellent route displaying varied scenery, branching and intersecting channels, areas of fast water, and many islands suitable for overnight camping. The historic value of this channel as part of the York Factory to Norway

House route gives national significance to this river. Following the completion of all proposed hydro-electric developments along the Nelson River the lower portion of the East Channel alone will remain as a near natural example of the Nelson River. This uniqueness merits its preservation.

6.4.2.6 Norway House

With road access to Norway House, there is an excellent opportunity to develop a significant historic site. Norway House was after Winnipeg or Fort Garry one of the most important trading and distribution points on the route to Hudson Bay and the West and was the main centre for the construction of York boats.

Many buildings dating to the early 1800's and historical artifacts and monuments still remain in Norway House and with suitable development could provide an historic site on the scale of Lower Fort Garry, depicting an additional facet of the fur trade which opened the north.

The restoration of existing buildings, the provision of displays, the construction of York boats could provide the impetus for a lucrative tourist industry in Norway House in addition to providing more diverse employment opportunities.

In summary then, the conceptual recreation plan for the Outlet Lakes with the hydro-electric developments envisages the following:

1. Fishing and hunting up the Minago River, Hill Lake, Drunken Lake and Black Duck Creek, and on Cross Lake around the mouth of the Minago River. Facilities would be required to serve this use. These could be provided near the Minago River crossing.
2. Attraction to the Jenpeg dam site for viewing and fishing in the tail race and forebay. This necessitates site enhancement and provision of some ancillary facilities for visitors.

3. Primitive canoeing and camping on the East Channel Nelson River below Sea River Falls and on Pipestone Lake and the southern portion of Cross Lake bordering Ross Island. This predicated access facilities at Sea River Falls and Whiskey Jack Portage as well as protection of the area by establishing an environmental corridor along these water bodies. This would also serve to protect a soon to be unique example of the Nelson River and an historic waterway.
4. Possibilities for development of a potential historic site at Norway House. This necessitates further investigations and feasibility studies. If developed, this would also require more visitor orientated services at Norway House.
5. A combination of all the recreation potential as described; the possibility of vehicular access to Cross Lake; and the present lack of accommodation facilities in Cross Lake settlement make a motel with cabins and a guiding and outfitting service feasible.
6. Vehicular travel to Kiskitto Lake necessitating provision of minimal facilities such as a boat launch ramp at the Kiskitto control dam.
7. Use of the Sipiwesk Lake area necessitating some campground facilities at the vehicular access point.

Provision of facilities, scale of the facilities and the timing of each provision is discussed under the Development Plan which follows.

6.4.3 Development Plan

6.4.3.1 Minago River

A campground should be developed on the Minago River at the road crossing to serve the hunters who are expected to frequent this vicinity. Vehicles and trailers could be parked here with the hunters dispersing by boat.

The campground has some easily reached beaches on Cross Lake associated with it and would also serve other visitors to the area such as fishermen, sightseers to the Jenpeg dam and campers desirous of spending several days in the area. This campground should have a minimum of facilities including non-modern sanitary facilities, a gravelled area for parking and fire pits. The existing four acre cleared area on the north shore of the road crossing would be adequate to fill present needs. As use increases and user patterns develop, expansion could be accommodated on the peninsula to the east of this clearing. A boat launch ramp should also be constructed in the immediate vicinity of the road crossing. The existing cleared area on the north side is sufficient to provide a manoeuvring area and parking lot for the boat ramp.

6.4.3.2 Jenpeg

Following cleanup of the Jenpeg site, day use picnic facilities and short term camping facilities should be established. These would include tables, barbecue pits or fire rings, non-modern sanitary facilities and parking facilities. If clean up of the Jenpeg site on the west bank was not carried out, an alternative site should be developed on the east bank below the Jenpeg dam.

A boat launch ramp should be constructed to allow access to the forebay area. This ramp should be in close proximity to the day use area. Similarly another boat launch ramp should be constructed to provide access to Cross Lake below the Jenpeg dam. This should be constructed near the day use area. If the day use area was located below the dam on the east bank shoreline, approach would be quite steep. More moderate slopes are found on the embayment of Cross Lake west of the dam.

6.4.3.3 Ross Island

The extension of the road to Norway House via Sea River Falls will have several ramifications as far as recreation is concerned. The road will in all likelihood, cross the existing Whiskey Jack portage road. This would provide car access to the more sheltered boating areas on the bays and inlets to the south of Cross Lake Indian Reserve and to the northern end of Kiskittogisu Lake. As the entire northern end of Ross Island and the East Channel is to be maintained as a semi-wilderness area, the only facilities should be a small campground and boat launch at such time as user demand and pressure warrant it.

At Sea River Falls, a wayside park with minimal facilities could be established. This would serve canoeists starting from that point and going down the East Channel or motorists seeking a stop-over and fishing site.

6.4.3.4 Norway House

The development of a significant historical site at Norway House would increase visitation to this community. This increased visitation would necessitate the eventual construction of a transient campground, possible expansion of the existing accommodation facilities, addition of outfitting services and the provision of services to supply the tourist industry such as restaurants, souvenir sales and grocery supply.

6.4.3.5 Cross Lake

Road access to Cross Lake settlement from Jenpeg also provides the opportunity for the establishment of a motel operation with associated outfitting and guiding services at the settlement.

6.4.3.6 Kiskitto Lake

The control facilities to be constructed at Kiskitto Lake and the

road to these facilities will open the lake to use by vacationers and sportsmen. Minimal facilities such as a boat ramp, non-modern sanitary facilities and picnic facilities at the road end, and possibly on one of the islands, would be all the development necessary here to provide a satellite alternative recreation facility to Jenpeg and the Minago River Site.

6.4.3.7 East Channel

The East Channel area of the Nelson River from Norway House to Cross Lake provides an excellent opportunity for a designated canoe route. An environmental corridor of one-third of a mile is required along the East Channel Nelson River. This would preclude road building and timber cutting and would preserve the area for recreational use and also preserve the last example of the Nelson River in a near natural state. This area provides various routes, interesting scenery and an opportunity to follow the historic route to York Factory via the Echimamish and Hayes Rivers.

A circle canoe route is also possible starting and ending at Norway House, down the East Channel to Cross Lake and Whiskey Jack portage, across the portage to Kiskittogisu Lake, then via Playgreen Lake back to Norway House.

6.4.4 Phasing of Development Programme

1973 - 1978

Campground boat ramp on Minago River

Picnic area Jenpeg

Campground Jenpeg

Two boat launches Jenpeg

Picnic area - wayside Sea River Falls

East Channel canoe route

Environmental corridor East Channel

Historic site Norway House

Motel - outfitter Cross Lake

Boat launch - picnic areas Kiskitto Lake

1979 - 1983

Historic site Norway House

Upgrading of campgrounds

Transient campground Norway House

Outfitter - Norway House

Circle canoe route

1983 - 1988

Historic site Norway House

Campground - boat launch Whiskey Jack Portage

1988 - 1993

Historic site Norway House

Campground expansion

6.4.5 Alternatives

If the roads are abandoned by Manitoba Hydro, and the Department of Highways does not assume responsibility, three possibilities exist; the effect of each alternative on the developments proposed thus far in this report are outlined below.

6.4.5.1 If there is no road to Norway House,

- (a) there would be no historic site development at Norway House.
- (b) there would be no need for a transient campground.
- (c) there would be no expansion of the existing accommodation facilities.
- (d) no additional visitor services would be needed.

- (e) no guiding or outfitting services would be needed.
- (f) there would be no wayside at Sea River Falls.
- (g) the East Channel canoe route would receive less use due to limited access; however, the environmental corridor should be established nevertheless.

6.4.5.2 If the Minago River bridge is removed,

- (a) there would be no campground, picnic or fishing use of the Jenpeg site.
- (b) no need to develop facilities on the Whiskey Jack Portage.
- (c) a campground would be necessary at the Minago River site.
- (d) motel, guiding or outfitting service would be needed at Cross Lake, but on a much smaller scale.

6.4.5.3 If the bridge is left intact and the road extended only to Whiskey Jack Landing,

- (a) campground, picnic facilities at Jenpeg would be needed.
- (b) motel and guiding-outfitting services would be needed at Cross Lake, on a small scale.
- (c) minor facilities would be necessary at Whiskey Jack portage.
- (d) primitive facilities would be needed at the Minago River site.

6.4.6 Demand Projections

Projecting visitor use of non-existent facilities based on traffic numbers using Highway 391 is highly speculative.

The figures included in this section were provided by the Research and Statistical Service Branch of the Department of Tourism, Recreation and Cultural Affairs. These figures are only approximations and are based on traffic counts for Northern Manitoba and present use patterns in existing park areas.

The use of any canoe routes will only be minimal with an estimated 20 to 25 parties per year, while canoe tripping around Ross Island might be expected to be two to three percent of the total parties visiting the area.

Estimates of the total parties (3.5 persons) visiting facilities at Jenpeg projected over 20 years are:

<u>Year</u>	<u>Total Parties</u>	<u>Year</u>	<u>Total Parties</u>
1973	500	1983	5,900
1974	500	1984	6,200
1975	1,000	1985	6,500
1976	1,500	1986	6,900
1977	2,000	1987	7,200
1978	3,000	1988	7,600
1979	4,000	1989	7,900
1980	5,100	1990	8,300
1981	5,400	1991	8,700
1982	5,700	1992	9,700

Of these total parties, about 50 percent can be expected to engage in sport fishing, while only five to ten percent of this figure would use the area for hunting.

Visitation to Norway House and an historic site there would be about 20 to 25 percent of the number of parties travelling to Jenpeg.

Existing facilities in the area would generate for a ten to 20 unit facility some 2,000 to 3,000 person days of hunting-fishing activity.

In 1970, the total number of visitor days spent in the Norman region was 1,001,389. Of this number 2.7 percent or 27,038 were spent

in the Wekusko Lake subregion, and the visitors spent \$169,528. This was based on an average stay of 5.74 days and an expenditure of \$6.27 per person per day.

Assuming the Wekusko area is similar to the Outlet Lakes, and using the present figures for the 1973 condition with hydro, we would have a total of 10,045 visitor days and an expenditure of \$62,982.15 in the Jenpeg region. By 1984 this could rise to 124,558 visitor days and approximately \$1,245,580 spent in the region by vacationers.

7. Conclusions

By comparing the two master plans, conclusions may be drawn regarding the benefits and losses accruing to the recreation potential of the Outlet Lakes region from the hydro-electric developments.

7.1

Damming the West Channel will, by raising the water levels, eliminate the existing gradient, thus the fast water and thus one of the few Manitoba rivers suited to white water canoeing. In addition to eliminating the main requirement for the white water canoe route; namely the fast water, other physical attractions of this route will be destroyed. These attractions include:

- (a) the numerous islands which presently enhance the channel;
- (b) the several sets of rapids; and
- (c) the beauty of pristine wilderness.

7.2

This will also cancel the high quality of camping experience presently available there in association with the white water canoeing.

7.3

The dam will create a reservoir which is more suited to some forms of recreation associated with a lake rather than a swift flowing river. These would include:

- (a) boating with craft of a deeper draught than a canoe;
- (b) use of high powered, fast travelling boats; and
- (c) still fishing.

7.4

The aesthetic quality of the reservoir area will be low due to the dead vegetation killed by the higher water level. Aesthetic quality is an integral part of the recreational experience and recreation potential. Thus, the quality of recreation experience available in the area plus the recreation potential of the area will be low without shoreline clearing. Both will be increased in direct proportion to the number of miles of shoreline which are completely rid of dead vegetation.

7.5

A hazard to reservoir boaters will exist if no timber clearing is done in that access to the shoreline will be difficult, if not impossible. In areas where complete shoreline clearing was not done selective clearing of access strips through the flooded vegetation at three mile intervals would allow access to the shoreline and thus would reduce this hazard.

7.6

An opportunity for fishing in the tail race of the Jenpeg dam will create additional recreation potential. It is expected that this will be one of the main factors attracting visitors to this area.

7.7

As a result of the hydro development this area will be accessible by automobile probably at least ten years before it would have been without a development of this nature. This has a short term gain in that it can provide an immediate economic benefit to the area. Assuming an initial visitation rate of 500 parties of 3.5 persons in 1974, by 1984 this could rise to 6,200 parties or 124,558 visitor days and approximately \$1,245,000 spent in the region by vacationers. Without

hydro, by 1984 there would be only some 29,406 visitor days and an expenditure of approximately \$294,060. Also it will make available a wider recreation base for the vacationing public, adding greatly to the present choice of areas.

7.8

On the other hand, this advanced accessibility date has some long term disbenefits. Present demand for recreation space is adequately met in Northern Manitoba. Participation in outdoor recreation is, however, growing at a rate of 7 to 10 percent annually. Prudent land use policy would advocate reserving desirable areas for future use as demand increases. Thus making the Outlet Lakes region accessible by vehicle, now has the disbenefit of reducing the long term reserves of recreation land.

7.9

As the participation in outdoor recreation increases fewer and fewer areas of pristine wilderness will be available for provision of a wilderness, camping, or canoeing experience. In addition to the previously discussed loss of the West Channel for this type of experience, hydro development will reduce such qualities in other parts of the Outlet Lakes system. More specifically, wilderness qualities will be lost by:

- (a) the existence of construction camp clearings. If these are visible from a water body, the wilderness experience which can be gained from the area will be diminished.
- (b) camp debris and camp buildings left, following completion of the dam construction. By reducing the aesthetic quality, the recreation potential is also reduced;

(c) roads, especially those constructed near or adjacent to wilderness water. By noise and visible presence these detract from this wilderness quality; and

(d) transmission lines, dams, dykes, and survey-cut lines.

These types of structures and the associated clearing are not expected in a wilderness setting and therefore detract from a wilderness experience.

7.10

The new roads in the Outlet Lakes area will provide a new recreation opportunity for motoring vacationers either driving solely to enjoy the experience of seeing where a new road goes or those driving in order to arrive at a place where other forms of recreation can be enjoyed. The satisfaction of the driving experience will be greatly influenced by the manner of construction and clean up used for building roads.

7.11

The increased accessibility will increase hunting opportunity and hunting pressure in the Outlet Lakes for moose and to a lesser extent woodland caribou and ducks. This could have some disbenefit to any local residents dependent on this hunting for meat. On the benefit side, in addition to the direct satisfaction to the outside hunters, opportunities exist to boost the local economy utilizing the hunting facet of the recreation industry.

7.12

Through a sufficient flow and maintaining an environmental corridor, the lower portion of the East Channel Nelson River can be preserved as a canoe route, a near natural example of the Nelson River, a prime area of

natural beauty and a historic waterway important to Manitoba's historic heritage.

7.13

Due to the regulation of Lake Winnipeg, low water levels are possible on Cross Lake during the summer months. Low water levels on Cross Lake would inconvenience recreational boating in the southern portions of this water body between the reserve and the north shores of Ross Island, because of possible insufficient depth to navigate the usual routes with small boats. Lower water levels would also make any travel by boat on Cross Lake a hazard; by exposing yet to be identified rock shoals.

7.14

With low water levels on Cross Lake it is doubtful that the Minago River will still remain navigable. Drops in levels of six feet would probably prohibit travel upstream to desirable hunting areas.

7.15

The viability of a potential motel outfitter service in Cross Lake settlement would be endangered whenever low water levels on Cross Lake hindered hunting activity.

7.16

The recreation potential of Kiskitto Lake will be enhanced by direct benefits to fisheries and wildlife. This will be accomplished through manipulation of Kiskitto Lake levels by means of a control dam at its mouth, an outlet channel and stop log dam at Black Duck Creek. The east end of this lake will then be available as a marginal recreation area accessible from Jenpeg via the construction road.

7.17

The airstrip at Jenpeg will provide a base for recreationists flying in on wheel base planes.

7.18

An opportunity exists to enhance the aesthetic appeal and the recreation potential of the Jenpeg dam area by:

(a) cleaning up, and grassing the open areas following completion of construction. These areas could be used by visitors to the dam site.

(b) placing visitor facilities such as toilets, fire pits and tables at the dam.

(c) placing boat launch ramps above and below the dam.

7.19

An opportunity exists to enhance the aesthetic appeal and the recreation potential of the Jenpeg dam forebay area by:

(a) completely clearing and burning all wood vegetation below full supply level;

(b) implementing a program to clean floating debris from the reservoir; and

(c) managing the reservoir levels to promote growth along the shore of desirable vegetation for wildlife.

7.20

An opportunity exists to develop an historic site at Norway House. This construction could utilize a local labour force which will be out of work following construction of the hydro electric scheme. Once established this site would continue to economically benefit the community. Not only would this project serve a useful purpose in the

actual preservation of an historic site, but as well, it may be regarded as an opportunity to ameliorate any social disruption which may occur as a result of the project.

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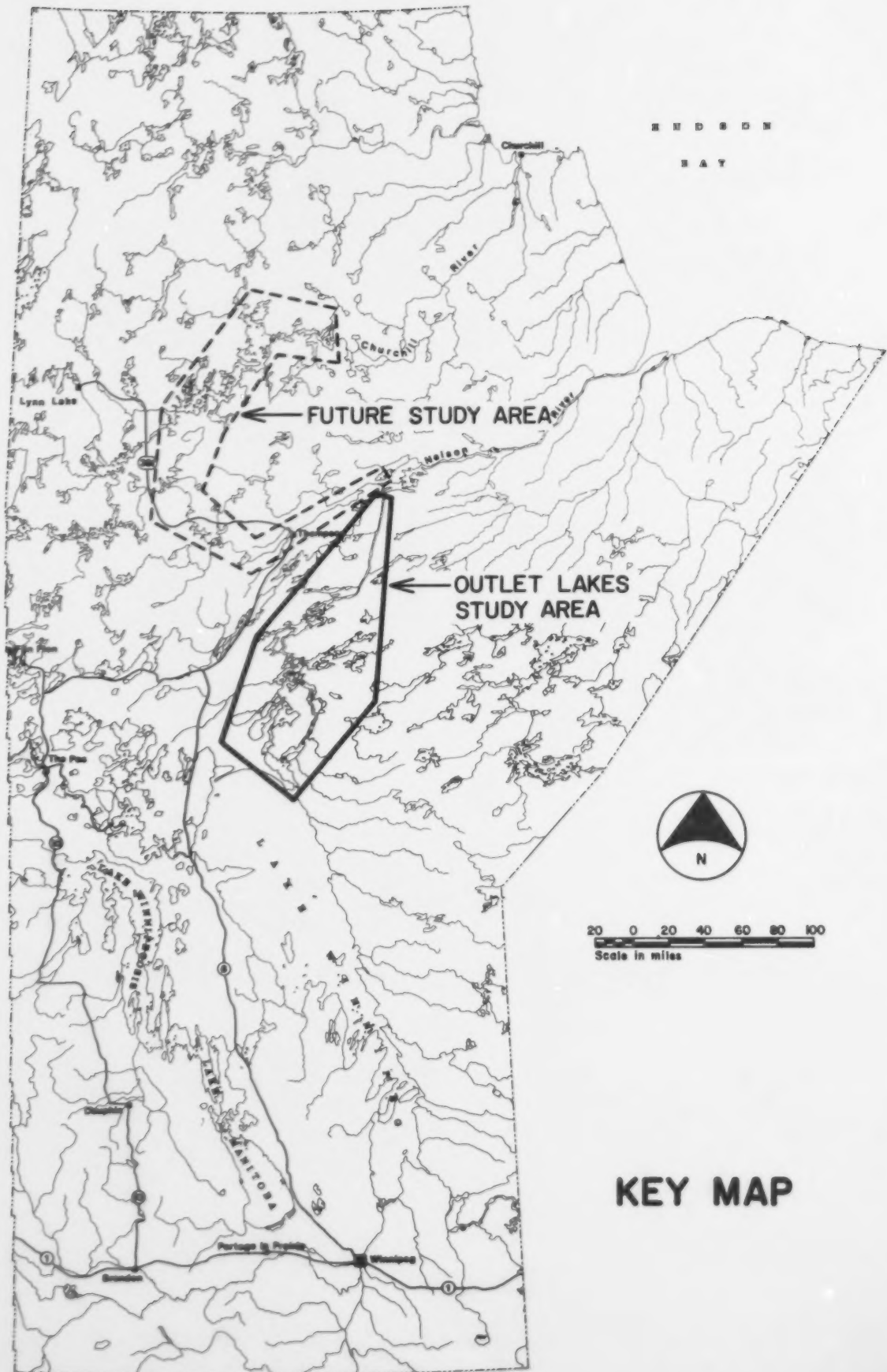
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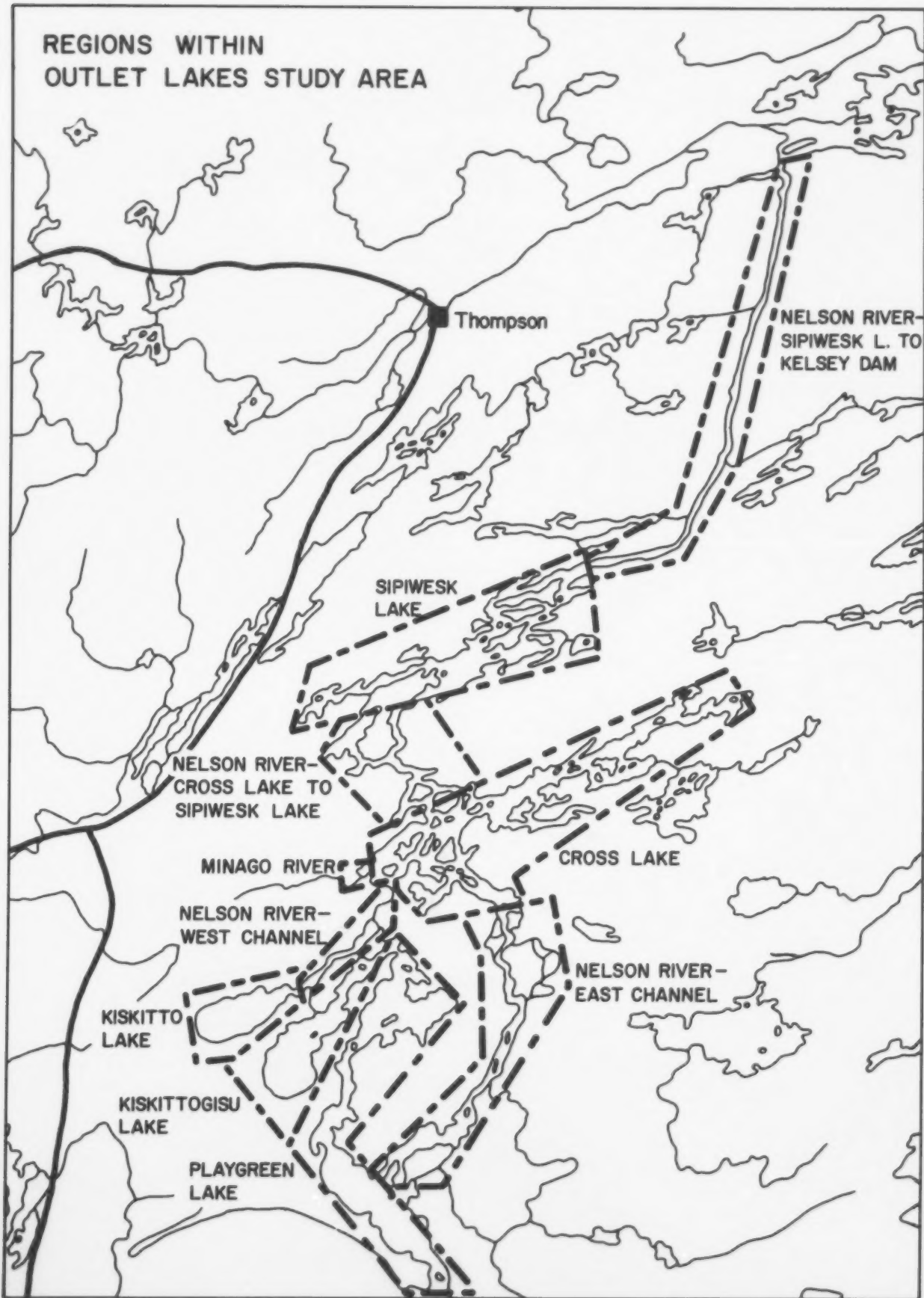
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MAP I

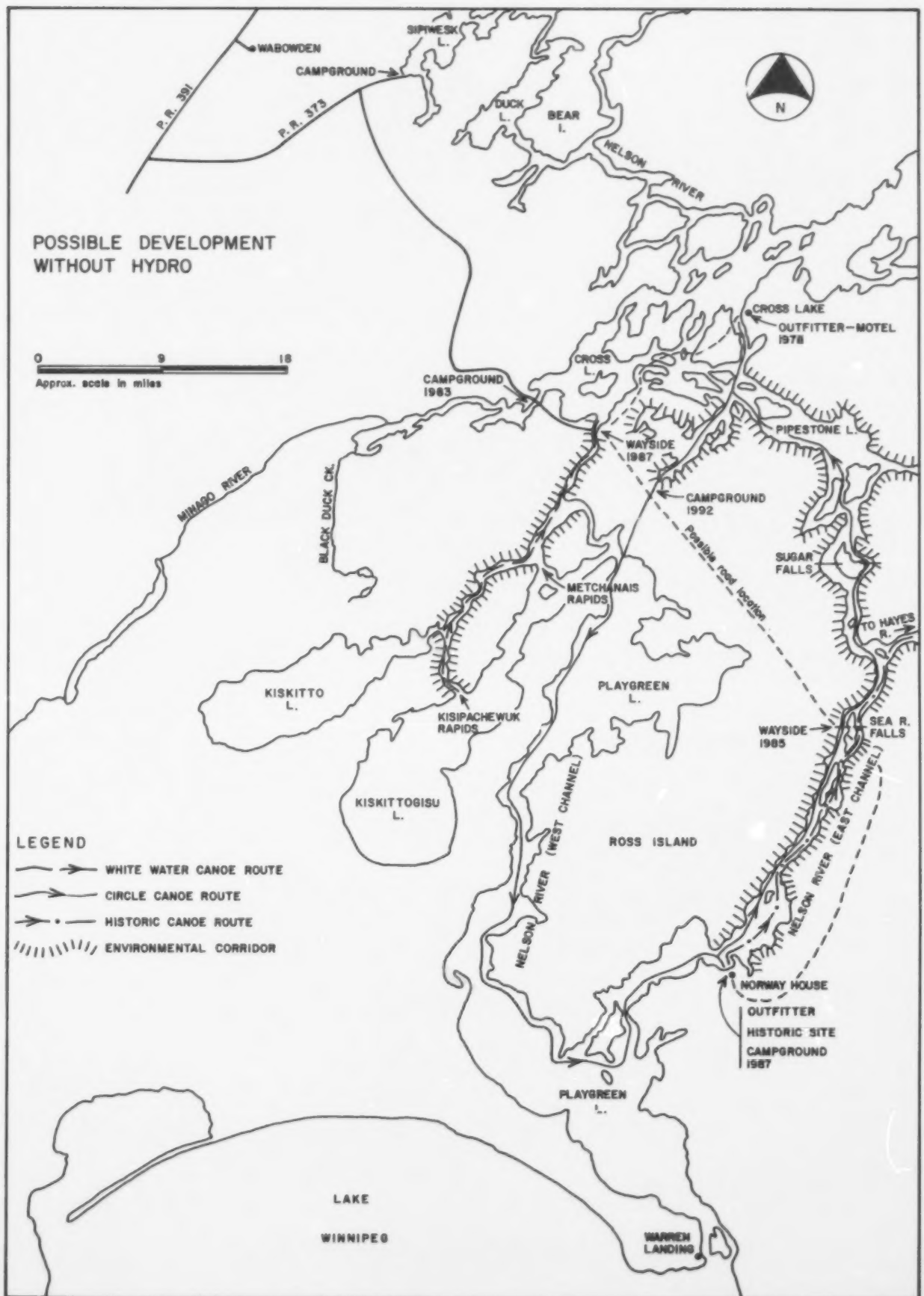


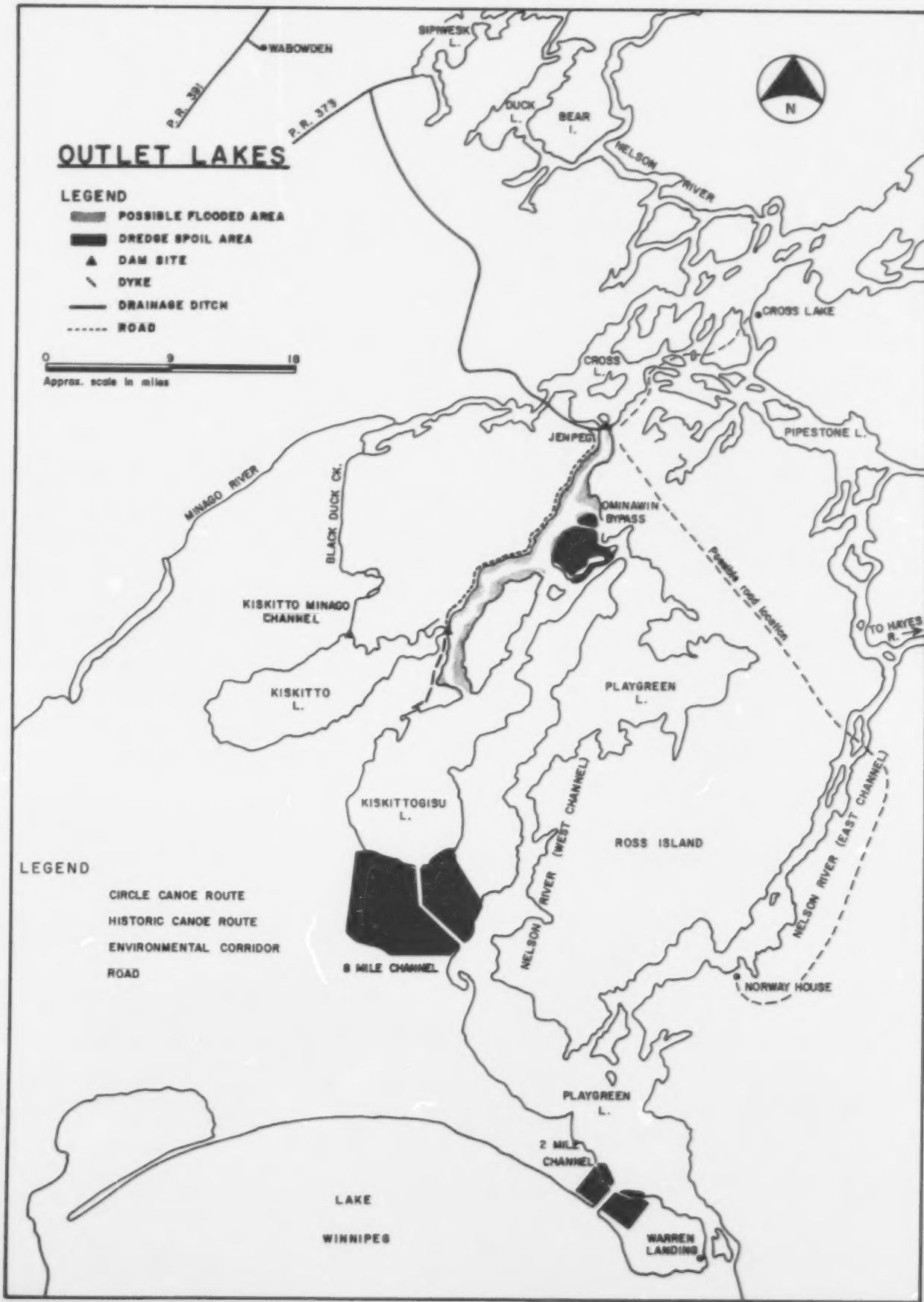
KEY MAP

REGIONS WITHIN OUTLET LAKES STUDY AREA

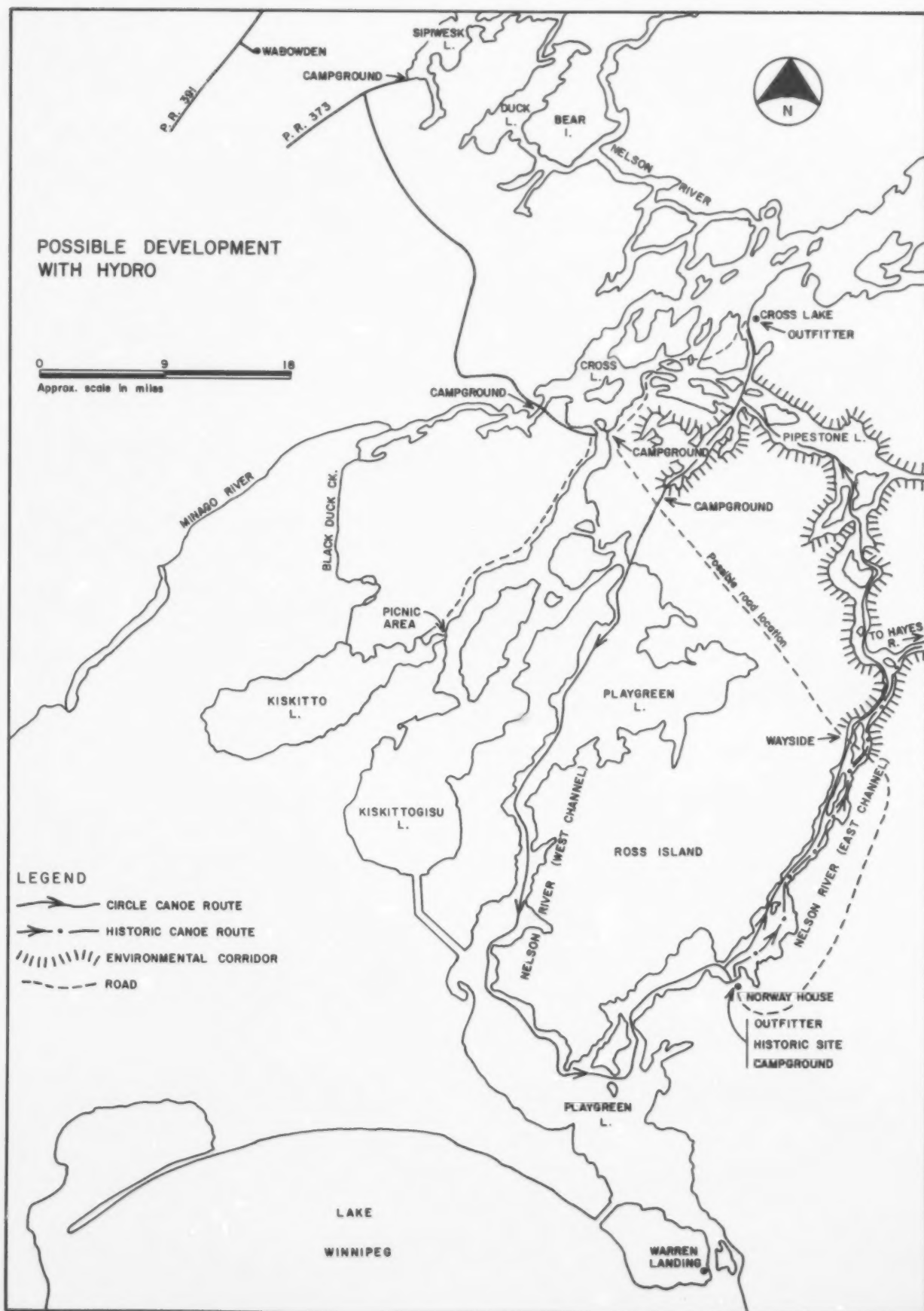


MAP 3





MAP 5



APPENDIX 7 - C

RECREATION ASSESSMENT OF THE
RAT-BURNWOOD DIVERSION ROUTE

RECREATION ASSESSMENT
OF THE
RAT-BURNTWOOD DIVERSION ROUTE

by

D. MOFFATT, W. SCHICK and J. LAMB
Parks Branch
Manitoba Department of Tourism, Recreation and Cultural Affairs
Winnipeg, Manitoba
April, 1974

for

THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD

SPECIAL NOTE

THE CONCLUSIONS AND RECOMMENDATIONS CONTAINED IN THIS APPENDIX ARE THOSE OF THE AUTHOR(S) AND ARE NOT NECESSARILY THE SAME AS THE CONCLUSIONS AND RECOMMENDATIONS OF THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD AS EXPRESSED IN THE SUMMARY REPORT AND THE TECHNICAL REPORT.

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COMPREHENSIVE REPORT

1. RECOMMENDATIONS

Dams

1.1 Manitoba Hydro should examine, as outlined in the conclusions, the feasibility of:

- a. locating the Manasan Dam upstream from the actual falls;
- b. locating the generators downstream from the falls;
- c. connecting the reservoir and generators by a power canal which would bypass the falls;
- d. releasing sufficient flows from the control dam to maintain the falls; and
- e. reducing summer releases through the generating system.

1.2 A strictly enforced ban should be imposed on exploration work around the immediate dam site until the feasibility of "1.1" is determined. This would prevent any further degradation of this site by mechanical tree and earth moving equipment and survey crews.

1.3 If the recommendations under "1.1" are considered feasible, Manitoba Parks Branch should immediately draft a recreation master plan for the area which would:

- a. allow day-use and viewing of the falls and environs while preserving their integrity;
- b. consider and make provisions for the recreational use of the reservoir, following impoundment;
- c. consider the visitor appeal which the dam, canal, powerhouse and tailrace will have.

1.4 Should recommendation "1.1" and thus "1.3" be carried out, actual implementation of plans for the area should be preceded by discussion and agreement between the parties concerned. These parties include:

- a. Manitoba Hydro;
- b. City of Thompson;
- c. Parks Branch of the Department of Tourism, Recreation and Cultural Affairs;
- d. International Nickel Company; and
- e. Lands Branch and Water Resources Branch of the Department of Mines, Resources and Environmental Management.

1.5 Manitoba Hydro should investigate the engineering feasibility of constructing (a) a weir at the mouth of the Footprint River just above Threepoint Lake to prevent the extra flows from the Churchill River diversion entering the Footprint River system; and (b) a pumping system to discharge the flow of the Footprint River into Threepoint Lake over the weir.

Outflows

1.6 Investigations should be carried out on controlling outflow from Notigi during the summer months to prevent extremely high water levels on Wapisu Lake, thus enhancing the recreation opportunities by leaving more beach and rock shelf shoreline exposed for use by recreationists.

1.7 Studies should be implemented on the feasibility of releasing greater flows from Missi Falls to maintain the environment and ecology of the lower Churchill River.

Clearing

1.8 The entire Notigi forebay should have vegetation slashed, piled and burned prior to flooding. This will remove the danger of submerged snags and deadheads, floating debris and dead standing timber.

1.9 At the Notigi dam site, those areas indicated on Map 6 should be placed under reservation to prevent further degradation due to continuing construction.

1.10 Clearing of the shoreline to flood level should also be carried out in the areas marked cottaging (Map 6) to aid in the development of a more natural shoreline along this stretch of the reservoir. If pre-flood clearing is not possible, post-flood clearing should be done.

1.11 The shoreline vegetation along the Burntwood River from Manasan Falls to two miles below the Thompson bridge should be cleared, piled and burned to flood level plus two feet or twenty-five feet from the present shoreline, whichever is less, to maintain a more natural shoreline in close proximity to Thompson.

Archaeological Sites

1.12 Sufficient funds should be made available for a thorough examination and excavation of the eight "A" priority archaeological sites along the diversion route. (Map 5)

Ecological Considerations

1.13 In consultation with the wildlife sector areas should be cleared to maintain or improve marsh habitat and to manipulate summer browse habitat for moose.

Mitigation Following Flooding

1.14 An inspection and clean-up program should be instituted following flooding to insure that all areas cleared are kept free of debris.

1.15 A program should be initiated to collect and boom floating debris following flooding.

1.16 Studies should be carried out in 3 to 5 years following flooding to determine the overall effects of flooding, the effectiveness of mitigation practices and to recommend additional mitigation practices.

1.17 Funds should be provided to clear additional areas as might be recommended by post-flood studies or other requests.

Towards an Enlightened Use of Northern Resources

1.18 All future projects of this nature involving Manitoba's landscape should be examined with the object of multipurpose use.

1.19 Future projects of this nature should begin well before design and allocations are irreversible by conducting a biophysical inventory and shoreline classification. Once an adequate inventory of resources is available and ecological relationships defined, impact statements should be prepared which would evaluate the primary project being proposed.

1.20 A provincial inventory of resources followed by major decisions as to criteria for designation and use followed by a comprehensive land-use plan should be completed. This would serve as a tool to evaluate the relative merits of future project proposals.

2. TERMS OF REFERENCE

This report covers the route of the Manitoba Hydro diversion of the Churchill River. It begins at Issett Lake, ten miles south and west of Southern Indian Lake, follows the Rat River to Threepoint Lake and the Burntwood River from Threepoint Lake to Split Lake.

The entire river system, the intervening lakes and several tributary rivers which will be affected by the diversion project were studied to assess their potential for outdoor water-oriented recreation.

The Parks Branch was required to assess the impact of water regime changes on identified recreation sites; to make recommendations to mitigate losses and enhance benefits accruing to recreation from the hydro developments; and to consider the feasibility of establishing such additional recreation opportunities as may be facilitated by the proposed developments.

3. OBJECTIVES

As with the two previous reports in this series, the entire area covered by the present study had never been adequately studied in terms of recreation potential. Before any statements could be made with regard to the impact of water regime changes on recreation, a survey of the area to identify recreation sites had to be done.

The first objective of the study was to conduct an inventory of potential outdoor recreation sites in the area. Following this, the second objective was to determine what effects Hydro's proposals would have on each site. Once it was understood how each identified recreation site and on a broader scale, how the entire recreational region would be affected by the hydro-electric developments, the third objective could be applied. This was to make proposals, which if effected, would minimize damage to and enhance the benefits to recreation within the region to be affected by the Manitoba Hydro proposals. The final objective of this study was to assist, along with the studies of other disciplines, in the formulation of a more informed and co-ordinated use of Manitoba's northern resources.

4. STUDY AREA

The area covered by this report includes the Rat River from Issett Lake ten miles south and west of Southern Indian Lake to Threepoint Lake and the Burntwood River from Threepoint Lake to Split Lake. This is the route for diverting water from the Churchill River into the Nelson River via Split Lake. The entire river system, the intervening lakes and several tributary rivers which will be affected by the diversion project were studied to assess their potential for recreation. The total distance of the traverse from Issett Lake to Split Lake is some 250 water route miles.

5. METHODOLOGY

5.1 The Rationale

Outdoor recreation is a nebulous amorphous type of expression. It can cover a very wide range of activities and still not be clearly understood by the average person. The Webster's dictionary defines recreation as a pleasurable occupation of leisure time, or a means of refreshment. It is, therefore, from this viewpoint that one must look at the Rat-Burntwood rivers system.

This report concerns itself with outdoor, water based recreation pursued in a natural setting without the formalized structured types of recreation facilities such as swimming pools, tennis courts and golf courses. The report is concerned with the preservation of the integrity of sites which possess unique recreational and scenic features as well as recommending the optimum uses for areas such that their desirability for recreation use is not negated by conflicting uses or over-use due to improper siting of a recreation facility.

A survey of outdoor recreation capability does not simply mean the cataloguing of all the beaches on a lake and the siting of campgrounds or parks using one or more small areas bounded by a perimeter which has little bearing on anything but a legal description. Designation of an area as a park does not necessarily mean that it has recreational significance and non-designation does not imply that an area has no recreational significance. It is, in many cases, a matter of degree. An area of special ecological interest may be designated to preserve and protect it by curtailing or severely limiting access and use. An area that is being heavily used may be made into a campground to control use. However,

designation may also result in over-use by making an area known and more attractive to use.

Areas like Southern Indian Lake and the Rat-Burntwood rivers system which may never come under a strict legal designation are not lacking in recreation capacity, but are too far removed from normal travel patterns as currently envisaged to receive intensive use. This does not mean that they will not be used for extensive recreation such as commercial resorts for hunting and fishing, possible wilderness camping use, fishing excursions from Leaf Rapids or weekend fishing and sightseeing trips from Leaf Rapids.

Various opinions exist regarding just what form an "Impact to Recreation" statement should take and what information it should comprise. One common expectation is that a statement reflecting how existing or proposed parks will be affected by higher water levels will be made. Another opinion is that the analysis will be a Canada Land Inventory type of shore-analysis. Still another view is that such a report should list the total dollar value loss or gain to the tourist industry. This report, by examining the total resource base and various policies applicable, considered the outdoor recreation picture of the Diversion Route in terms of each of these expectations. Then, on the basis of these discussions, constraints, and the demand projections, a total recreation master plan for the study area was developed. A similar examination of the projected resource base for post-flooding conditions led to the development of another outdoor recreation master plan. By comparing pre-and post-flooding plans, gains and losses to outdoor recreation were identified.

Following this, consideration was given to methods whereby benefits could be enhanced and losses ameliorated.

5.2 The Process

The preliminary in-office study involved the analysis of forest inventory maps to identify major areas of desirable vegetative cover, a review of the literature pertaining to the study and an examination of air photos and aerial mosaics. This preliminary study provided the background data and regional overview necessary for the summer's field work.

Field work was carried out by dividing the study area into regional components based on access. Each regional segment of the study area was inventoried as a unit by aerial reconnaissance and ground survey. Areas having desirable foreshore characteristics, shoreline characteristics, backshore composition, scenic qualities and water body characteristics, were noted. Pertinent information was recorded on topographic maps, tapes, air photo mosaics and by colour slides.

Specific resource information was requested from other disciplines.

Utilizing this information plus Parks Branch site evaluation data such as foreshore characteristics, shoreline characteristics, backshore composition, aesthetic characteristics and water body characteristics, macro areas having recreation potential were defined.

The suitability of an area for recreation, the type of recreation it is suited for, and the intensity of use it is capable of, varies according to a combination of attributes and the quality of each attribute.

The prime recreation orientation will be directed to water use for powerboating and fishing. It is important that these activities can be

carried out with a minimum of danger or hazard. Therefore, water bodies were judged on the availability of sheltered coves, bays and channels, the absence of large areas of open water and the absence of a large number of shoals, submerged rocks and extensive weed growth.

An important consideration was the shoreline accessibility so that areas having sand beaches or approachable rock shorelines were preferred to areas with rubble shoreline or extensive mud flats and weed growth.

The quality of the backshore affects the type and intensity of use to which an area is suited. For intensive use and backshore development, a varied timber cover, adequate soil depth, and adequate drainage is required.

By using the existing forest inventory data and a system of classification based on species composition, forest stands within each area were classified according to recreational potential.

A forest stand is considered prime for recreation development if it is diverse in its species composition; has a prevalence of species which indicate desirable qualities such as good drainage and high tolerance to use; and if it is not over-mature. For example, a pure stand of black spruce is usually undesirable since it is most often indicative of poor drainage, and has proven from past experience to be unsuitable for development because of its susceptibility to windfall. Information is also available on stand density and crown closure conditions. Thus, prime recreation land on a micro scale can be pinpointed in the midst of a larger or macro site of many square miles.¹

¹Doug Mazur: Recreation Land Identification System, Dept. of Tourism, Recreation and Cultural Affairs, Parks Branch, Winnipeg. 1971

Potential for sport fishing is an important concern for recreation in Northern Manitoba. According to the Norman Tourist Study,¹ 69 per cent of all visitors to Northern Manitoba engage in sport fishing. It may be speculated that this is one of the main reasons for visitors venturing north of the 52nd parallel.

Scenery and aesthetic quality are important weighting factors when considering the recreational potential of an area. These are important for several reasons. It is assumed that persons seeking outdoor recreation prefer a scenic area. Thus areas of changing landscape relief; with irregular shoreline configurations and with a diversity of backshore vegetation are considered to have more recreation potential than areas of continuous low relief; with very few shoreline indentations or changes in course; and with unvaried timber cover. It was that any reduction in the aesthetic quality of an area decreased the recreation potential. Thus, areas of lower recreation potential will include extensively burned areas, flooded areas with standing or floating dead timber, and areas scarred by mechanical earth movers or tree clearing equipment.

From another viewpoint, just as attempts are made to preserve examples of unique or outstanding human history, ecosystems, or wildlife populations, so by identification and designation, an attempt should be made to preserve outstanding or unique scenic areas.

¹D. B. McCloy: Norman Tourist Study. Dept. of Tourism, Recreation and Cultural Affairs, Research and Planning Branch, Winnipeg, Manitoba December 1970.

The presence of wildlife or waterfowl also enhances the recreation potential of an area. Wildlife based recreation can include consumptive forms such as hunting as well as non-consumptive uses such as photography and viewing.

Access to an area is an important regional constraint when considering its recreation potential. If it is impossible or prohibitively expensive to reach an area, its potential is severely limited. Therefore, areas easily accessible by car or by boat from population centres hold more innate potential than those that are very remote. However, it is necessary to identify inaccessible areas displaying a high recreation potential and to preserve them for future use. New technology and transportation may open these areas in the future.

Thus, from the entire study area, macro areas having recreation potential could be identified. The next step was to analyse the impact of Manitoba Hydro's proposals on these areas. During the field season of the summer of 1973 micro sites were identified within the macro areas for field checks. This facilitated projection of the impact of Hydro's proposals and recommendations for amelioration of losses or enhancement of benefits.

This report was written within the guidelines and practicalities of existing Manitoba Parks Branch policy. Parks Branch policy for recreational development in northern Manitoba would appear to be that if access is available to an area, and use is being made of the area, limited facilities will be provided if warranted. No access roads would be developed, however, solely to provide for a recreational experience, unless an intense need was demonstrated, or pressure exerted.

No intensive developments would be undertaken unless the designated area fills the requirement of providing a unique recreational experience.

The ultimate step in this study would have been an evaluation of the project within the perspective of a total provincial recreation master plan. This is non-existent at this time. The same situation would appear to exist for other resource-based concerns. An absolute inventory of resources for the entire province followed by an overall land use plan is required. Only then can the impact of a project such as the Churchill River Diversion be fully evaluated.

6. OBSERVATIONS

6.1 Recreation in Northern Manitoba

The demand for outdoor recreation is growing in the north at about five % per year.¹ However, due to a general paucity of statistics and the many drawbacks of straight linear projections of visitor statistics, the following section is only an attempt to show which activities receive the greatest participation. No attempt is made to provide visitor projections as they do not at the moment provide a reliable indicator of projected use or demand.

6.2 Activity Preferences

A recent survey of Thompson residents indicates a certain response to outdoor recreation. A large proportion of the population is non-active while, of those residents who are active, the majority participates only during the summer months. This is to the severity of the winters and to the cost of winter participation, e.g. snow-mobiles.

The activities undertaken lend themselves to the northern environment. In order of importance, they are:

1. picnicking
2. fishing
3. swimming
4. camping
5. boating
6. cottaging

Cottaging is the least important due to the high cost of construction in the north, and the high mobility of the northern residents which prevents large capital investments in permanent building structures.²

¹Personal communication Research and Statistics Branch, Department of Tourism, Recreation and Cultural Affairs.

²Ibid.

Most of these activities are presently carried out at Paint Lake or on the Burntwood River. Paint Lake, however, is becoming crowded and people are looking for new areas in which they can pursue these interests.

With the completion of P.R. 391 from Thompson to Lynn Lake, a vast new area has become available for those people who are dissatisfied with the facilities at Paint Lake Provincial Recreation Area.

The new road passes numerous lakes which will now be available for boating and fishing, while the river crossing areas provide access to the entire Rat-Burntwood rivers drainage area.

During the summer of 1973, numerous vehicles were encountered carrying boats or hauling trailers; people were exploring the new road and the wilderness area it has opened to general use.

Vacation traffic along the new road is expected to be about 106 vehicles per day, and facilities must be provided for this traffic and local use to prevent the total degradation of areas accessible from the road.

6.3 Resource Analysis

To properly assess the recreation potential of an area, the natural resources which provide the main incentive for most northern visits must be thoroughly analysed to determine what type of use they can best support without excessive damage to the natural condition.

¹Ibid.

6.3.1 Physiography, Soils and Vegetation

The diversion route study area is part of the Nelson River Basin and lies within the Precambrian Shield. The rivers pass through two physiographic divisions, the Transitional Zone and the Upper Nelson Plain.¹ Generally, The Transitional Zone is undulating to rolling with discontinuous deposits of clay in localized depressions with much peat overlying glacial drift. The Upper Nelson Plain is undulating with extensive areas of lacustrine clay deposits interspersed with areas of rock outcrop and bog.

The surface of the study area has been severely glaciated and is covered with varying amounts and thicknesses of glacial drift with abundant rock outcrops and localized clay deposits in depressions. The general relief is between 700 to 900 feet above sea level. The dominant soil types are grey wooded and organic.

A suitable soil type is sought when considering possible intensive recreational development of backshore areas. Such developments might consist of structured campgrounds, cottaging, and the connecting roads. Medium to well-drained coarse textured mineral soils, as opposed to poorly drained organic soils are preferred. Usually, backshore soil type is of importance only as it affects shoreline composition when considering extensive water and shoreline based forms of outdoor recreation as is the case in much of the study area. As well, when considering proposed reservoirs such as this, knowledge of backshore soil conditions is necessary when predicting the characteristics of the new shoreline.

¹T. R. Weir: Economic Atlas of Manitoba, Department of Industry and Commerce. Winnipeg 1960 p.6

Course textured, sand beach forming soils and smooth bedrock of less than forty per cent slope are conducive to shoreline accessibility and thus increase the recreational capability of a water body.

Mixed vegetation stands are preferred for intensive recreation development for several reasons, diversity adds to the scenic or aesthetic appeal of an area. Diversity is also a good indicator of ecological stability. Mixed vegetation tends to withstand slight modifications such as opening up of an area whereas pure black spruce stands once opened are very subject to windfall.¹

The bio-physical land inventory which was conducted by the Canada-Manitoba Soil Survey and funded by the Study Board has classified the study area as nine land districts within one land region. Land districts are areas of land within land regions characterized by a distinctive pattern of relief, geology, geomorphology and associated vegetation. (Lacate, 1969), Land regions are defined as areas of land characterized by a distinctive regional climate as expressed by vegetation (Lacate 1969).

The land region involved is the Boreal Land Region described as follows:

"Boreal Land Region (3): Regional vegetation on gently sloping medium and fine textured materials is closed black spruce forest with a continuous ground cover of mosses. White spruce and trembling aspen are restricted to lake shore and river courses.

¹J. Lamb, W. Schick; Recreation Study Southern Indian Lake, Parks Branch, Dept. of Tourism, Recreation and Cultural Affairs, Winnipeg, November 1973. p. 41-43.

Jack pine occupies sand plains and bedrock outcrops. Localized permafrost in mineral materials; but discontinuous occurrence of wooded palsas and peat plateaux with permafrost in organic materials."

The land districts are described below and shown on Map 2:

6.3.1.1. IL Issett Lake Land District

Characterized by extensive, thick organic deposits, thick lacustrine clay and silt deposits, and infrequent Precambrian gneissic and granitic bedrock outcrops.

The extensive peat areas have a low relief. The peat is generally thicker than 9 feet, saturated, and without permafrost, particularly along the Rat River. Palsas and peat plateaux are quite common in this District and are often associated with variations in relief of the underlying materials. These landforms can support fairly good black spruce forests which may be mixed with white birch and, to some extent, trembling aspen.

The lacustrine areas generally have a gently undulating topography. Black spruce and, to a lesser extent, white spruce and trembling aspen form the forest vegetation. Permafrost is common in the mineral soil and raised clay land-forms with slumping edges are frequently encountered.

The ice content of the permafrost varies from moderate in the mineral materials to high in the peat deposits.

The shore materials of the water bodies consist of exposed bedrock, and clay and organic materials. The Rat River proper mainly has organic shore materials.

6.3.1.2 RL Rat Lake Land District

Characterized by Precambrian gneissic and granite bedrock, which is close to or at the surface in the major part of the area, and lacustrine clay and silt deposits and peat deposits overlying lacustrine materials.

The bedrock areas are undulating to moderately rolling; bedrock frequently exposed. In depressions and on lower slopes the bedrock is covered by thin to thick lacustrine materials which, in turn, are overlain by organic deposits in depressions. The dry sites generally have a subseral jack pine cover with black spruce, jack pine, white birch and trembling aspen. In poorly to very poorly drained locations the tree cover is stunted black spruce mixed often with tall willow and alder.

Permafrost occurs on the slopes and in depressions, mainly under or in thick organic layers and has a medium to high ice content.

The lacustrine areas have a topography ranging from gently undulating to gently rolling, depending on the degree of control by the underlying bedrock. The forest cover is mainly black spruce, which may be replaced (as the result of fire) by jack pine and white birch on the drier sites and by trembling aspen on fresh to moist locations. Permafrost is found throughout but occurs mainly on sites with a thick LFH or peaty layer. Ice content is moderate to high.

The organic areas have a low relief. The very wet peat areas have a sedge vegetation. A forest cover of black spruce, mixed with white birch is found on the raised peat landforms. The ice content of the permafrost in peat palsas and peat plateaux is high.

Many lakes occur in this district; they vary in size from small to moderately large, are deep, and contain many rocky islands. Shore materials are mainly bedrock, clay or organic in nature.

6.3.1.3. NL Notigi Lake Land District

Characterized by Precambrian gneissic and granitic bedrock, which is exposed or very close to the surface in most of the area, and lacustrine and peat deposits in valleys and depressions.

The bedrock areas have rather steep slopes with rounded or flat crests. The topography ranges from gently to strongly rolling. Exposed bedrock is usually void of vegetation. Black spruce and jack pine can be found in shallow depressions where unconsolidated materials have accumulated. On the slopes a thick layer of mainly lacustrine materials overlays the bedrock, and more and better tree cover is found.

The lacustrine areas have a gently undulating to gently rolling topography which is slightly to moderately controlled by bedrock except in the valleys and plains between the bedrock outcrops. These materials are often overlain by an organic deposit. Black spruce is the most common tree species but trembling aspen, balsam poplar and white spruce are found on suitable sites, the later two especially in the vicinity of lakes and rivers. Permafrost is found in these mineral soils when drainage and thickness of the organic layer are favourable.

Peat deposits of varying thickness frequently overlay the lacustrine materials. Permafrost is found in the raised peat landforms and has a high ice content.

Small and moderately large lakes are scattered throughout the district. Shore materials consist of bedrock and clay.

6.3.1.4 NH Nelson House Land District

Characterized by Precambrian gneissic and granite bedrock which is either exposed or covered with a thin overlay of lacustrine and/or organic materials. Thin to thick lacustrine deposits occur in the valleys and on the slopes of the bedrock-controlled terrain. Thin to thick organic deposits have developed in areas with impeded drainage.

The bedrock outcrops have gentle to steep slopes but are rounded or flat at the top. Shallow lacustrine and/or organic deposits overlie the bedrock in depressions and on the gentle slopes. The present vegetation on gently sloping sites is mainly subseral and dominated by jack pine, but black spruce will likely form the climax. White birch is also often found in these areas. On slopes with somewhat thicker mineral deposits trembling aspen can form the intermediate forest cover, but will be replaced by black spruce in advanced stages of forest development. Black spruce forms the forest vegetation on organic deposits. Very little permafrost is encountered in the bedrock-controlled areas; when present, it occurs in the organic deposits.

The lacustrine deposits have a gently undulating to rolling topography. In the latter case the relief is bedrock-controlled. Black spruce forms the climax vegetation on most sites, but as a result of fire, is often replaced by jack pine, white birch or trembling aspen, depending on moisture regime. Permafrost is more frequently found in these areas, especially in locations where a peaty overlay has developed.

The organic deposits have low relief and overlay lacustrine materials. A forest cover of black spruce occurs on the raised peat land forms (palsas and peat plateaux). The ice content of the permafrost is high. Collapse scars and fens generally lack tree vegetation, although scattered stunted tamarack and black spruce occur, in particular in ridges.

A number of large, deep lakes occur in the district; the shore material consist mainly of exposed bedrock.

6.3.1.5 AL Apeganau Lake Land District

Characterized by thick lacustrine clay and silt deposits and thin to thick organic deposits overlaying lacustrine material. Precambrian, gneissic and granitic bedrock at or close to the surface occur in isolated areas.

The lacustrine clay and silt deposits have a very gently undulating to very gently rolling topography and are generally thick to very thick over bedrock. These deposits are laminated, with the clay and silt laminae varying in thickness. Common soils encountered are Gray Luvisols and Low Humic Eluviated Gleysols.

Black spruce generally forms the climax forest vegetation. Most sites are imperfectly drained and have rather thin organic layers overlaying the mineral materials.

Permafrost is found throughout but is not widespread. The active layer is about 2 feet thick.

Extensive thin to thick organic deposits occur which are usually underlain by lacustrine materials. These peatlands have a very low relief.

Black spruce cover is found on the raised peat bodies which contain permafrost. The wet peatlands — collapse scars and fens — are almost void of tree vegetation, except for scattered, stunted tamarack and black spruce. The ice-content of the permafrost is high.

The bedrock-controlled areas are undulating to rolling and contain frequent bedrock outcrops. The unconsolidated mineral overlay varies from thin to thick as does the organic overlay in depressions. Black spruce forms the climax forest cover but, as a result of fires, the present cover consists of jack pine, white birch or trembling aspen with black spruce as understorey.

Permafrost is found on the lower slopes where a peaty layer has developed. Some permafrost occurs at depth in mineral soils with thin LFH. Ice contents vary from high to low. Two lakes of moderately large size occur in this district. Shorelines are irregular to regular. Shore materials consist of exposed bedrock, clay and organic materials.

6.3.1.6 PH Partridge Crop Hill Land District

Characterized by sandy end-morainic and glaciofluvial deposits, and thin to thick organic accumulations. Precambrian gneissic and granitic bedrock occurs frequently at or close to the surface.

The morainic and glacio-fluvial areas are gently undulating to rolling. Parts of these areas are flat, lower slopes often being covered by organic accumulations. Silty materials occur along the edges of the sand deposits, and often have an organic overlay. In general, this silt overlies clay-textured lacustrine material. Most common soils are Dystric Brunisols on the sandy deposits and Rego Gleysols and Gray Luvisols on the lacustrine materials.

The present forest cover consists of jack pine and white birch. If left undisturbed, black spruce may form part of the forest cover. Lower slopes and flat areas with impeded drainage have a black spruce cover.

Permafrost does not occur in the better drained materials. Some permafrost may be found in moist areas with thick organic accumulations. The wet to very wet conditions that prevail in most of the District have inhibited the development of permafrost.

The lacustrine areas have a very gently undulating to slightly rolling topography. Some steeper relief is found in areas where bedrock affects the topography. The forest vegetation on these landforms is the same as in land districts PL and HL. Permafrost is somewhat less frequent than in the aforementioned land districts, even on sites with sufficient organic insulation. The organic peat lands have a very low relief. Permafrost is found in palsas and peat plateaux (see PL and HL).

The water bodies in this district are generally small and shallow with regular peat shorelines.

6.3.1.7 WW Wuskwatim Lake Land District

Characterized by thick lacustrine clay and silt, thin to thick organic accumulations overlying lacustrine materials, thin lacustrine and organic deposits underlain by Precambrian bedrock, and exposed bedrock.

The lacustrine areas have a very gentle undulating to gentle rolling topography, slightly influenced by the configuration of the underlying bedrock. These deposits have silt and clay laminae of varying thickness. Common soils encountered on these deposits are Gray Luvisols and Low Humic Eluviated Gleysols.

Black spruce forms the climax forest vegetation on most sites. Depending on moisture regime, the thickness of the organic layer will vary from a thin LFH layer composed of feather mosses and forest litter to peaty overlays composed of dead and living sphagnum and feathermosses as well as forest litter.

The present vegetation is often in an intermediate, subseral stage. In these stands black spruce often constitutes an important component of the species composition, depending partly on the time lapse since disturbances. Jack pine and white birch generally predominate in subseral forests on dry sites while trembling aspen is dominant on moist locations. Sites with a peaty overlay generally have a black spruce vegetation with alder and willow forming an extensive shrub cover.

Along lakes and rivers white spruce and balsam poplar form part of the species composition. Permafrost is not widespread in this area and is confined to those soils which have a peaty overlay.

The low relief organic deposits are thick to thin and are underlain by lacustrine materials.

The very wet organic areas have fen-type vegetation and have little or no tree growth. Stunted tamarack is evenly distributed or, in the case of patterned fens, occurs on the ridges. Some stunted black spruce may be present, particularly along the borders of these units.

The raised peat landforms are the result of peat accumulation, permafrost, and sometimes underlying materials. They support a black spruce forest cover of varying density and height growth. White birch often occurs in association with the black spruce. The active layer is normally $1\frac{1}{2}$ to 2 feet thick and the ice content of the permafrost is high.

Areas consisting of a thin overlay on bedrock or exposed bedrock show slight elevation differences over short distances but generally speaking, have a weakly broken topography. In depressions organic material has accumulated which may overlie bare bedrock or thin lacustrine deposits. Permafrost is of local extent in these areas.

The main water body of this district is Wuskwatim Lake which has irregular to regular shoreline. Bedrock comprises the dominant shore material, with clay and organic materials being of lesser importance.

6.3.1.8 PL Paint Lake Land District

Characterized by thick lacustrine clay and silt deposits and thick to thin organic accumulations that overlie lacustrine materials in depressions and flat areas with impeded drainage. Precambrian gneissic and granitic bedrock is infrequently exposed or close to the surface.

The lacustrine areas have a very gently undulating to gently rolling topography and are generally thick to very thick over Precambrian bedrock. These deposits have alternating clay and silt laminae which vary in thickness from location to location, but also with depth. The common soils are Gray Luvisols and Low Humic Eluviated Gleysols.

Permafrost is found in poorly and imperfectly drained areas when a thick organic layer is present. The active layer is about $1\frac{1}{2}$ to 2 feet thick. The permafrost extends into or occurs solely in the material soil, the latter situation occurring infrequently in better drained positions.

Black spruce forms the climax forest vegetation on most sites i.e., moisture conditions range from fairly dry to wet. Along lakes and rivers the climax forest is a mixture of white spruce, black spruce, trembling aspen and balsam poplar. The present forest cover is often subseral in nature. On the well-drained sites, jack pine and white birch with some black spruce will form the forest cover after fire, while trembling aspen will be subseral on moist sites. On sites with a thick organic overlay, the fire regeneration is mainly black spruce.

Extensive areas consist of thick to thin organic accumulations which have low relief. The slight differences in elevation in these peatlands are a result of permafrost and peat accumulation. In wet and very wet peat areas, which consist of sedge peat and/or sphagnum peat over sedge peat, tree growth is very stunted. Scattered tamarack and some black spruce are the tree species present. On the frozen elevated peat bodies (palsas and peat plateaux), the forest cover can be rather dense and consists mainly of black spruce with some white birch. The peat material consists of sphagnum and forest peat, often over sedge peat.

The large lakes in this district have irregular, mostly bedrock-controlled shorelines, are fairly deep and dotted with bedrock-controlled islands. The smaller lakes are shallow and have rather smooth, peaty and/or clay shorelines.

6.3.1.9 MY Mystery Lake Land District

Characterized by deep lacustrine clay and silt, and glacio-fluvial sand and gravel. Thick to thin organic material overlies the mainly lacustrine mineral deposits in depressions and flat areas with

impeded drainage. Some infrequent Precambrian gneissic and granitic bedrock outcrops occur.

The lacustrine clay and silt deposits have a gently undulating to gently rolling topography and are generally thick to very thick over bedrock. These deposits are laminated, the laminae usually being greater than one inch thick. The common soils encountered on these deposits are Gray Luvisols, which may or may not show evidence of cryoturbation and Low Humic Eluviated Gleysols.

Black spruce will form the climax forest vegetation in most sites. Depending on moisture regime, the groundcover will vary from a thin organic layer of feathermosses, lichen, and forest litter to rather thick layers of organic material derived from feathermosses and forest litter. The present forest vegetation may be completely different from that in the climax stage, owing to disturbances mainly caused by fire. On dry sites, jack pine, white birch, and to some extent, black spruce will form the intermediate forest cover. On more moist sites, trembling aspen will form a major component of the subseral forest cover. In areas with poor drainage, black spruce will form the fire regeneration as well as the climax forest. Along lakes and streams the stable vegetation is often a mixture of black spruce, white spruce, trembling aspen and balsam poplar, the latter occurring especially in areas which are flooded from time to time and are subject to some deposition of alluvial materials.

Permafrost is found in areas which have imperfect or poor drainage and an organic surface layer thick enough to create adequate insulation. The active layer varies in thickness from 18 to 30 inches,

but may be locally thicker. Ice content of the permafrost is low.

The glacio-fluvial deposits are undulating to gently rolling in topography. These deposits are generally quite deep, the underlying bedrock having very limited influence on the topography. Degraded Dystric Brunisols are the common soils present with Orthic Regosols occurring in disturbed areas, such as blow-outs.

As a result of fires, jack pine and white birch often form the forest cover. Black spruce may constitute part of the stand mixture and forms the climax forest cover if no disturbances occur. The organic surface layer is generally thin and composed of feather-mosses, lichen and forest litter. Because of their textures, these landforms are normally well drained and little or no permafrost is found. Some permafrost is found in those areas that have heavier organic mantles in which case the permafrost occurs in the organic material.

The low relief organic deposits vary from thick to thin and are usually underlain by lacustrine materials. The moisture regime varies from saturated to rather dry as a result of peat buildup and permafrost. The wet to very wet areas are comprised of sedge peat, sphagnum peat, or mixtures of both. Palsas and peat plateaux are organic landforms that are raised compared to the surrounding area as a result of peat accumulation and permafrost. A relatively extensive forest cover is found on these landforms whereas fen-type landforms generally lack tree vegetation. The stable forest cover on the palsas and peat plateaux is black spruce with a variable component of white birch. The active layer is about 18 inches thick and the surface is rather dry. The ice content in the frozen peat is high.

Very few lakes occur in this area. The ones that do occur are pitted lakes in the flacio-fluvial material, which are small, fairly deep, and have sandy shores. Some small to medium sized lakes occur in the remainder of the area. The shores of these lakes, as well as the rivers consist of clay and bedrock primarily.¹

6.3.2 Wildlife

Moose are present in the study area in moderate populations. The average concentration even in good habitat areas is only 0.5 per square mile which is normal for northern Manitoba. They have not been hunted on a sport basis due to access problems so the main use has been to supply local meat needs for Nelson House. No estimate is available of the number of moose taken annually by the local native population.

Waterfowl are apparently quite plentiful with unverified reports indicating thousands of nesting ducks in marshes along the rivers and tributary streams.

It may be possible to create and improve habitat areas in order to maintain present populations and to endeavour to increase the carrying capacity of the habitat areas.

Fur bearers such as beaver, muskrat, and lynx are plentiful, with signs of beaver and muskrat being everywhere along the rivers and tributary streams. Otters are also present but they were not observed with any regularity.

6.3.3 Archaeologic and Historic Highlights

Within the Rat-Burntwood study area there are 32 archaeologic sites where some excavation has taken place and 20 random finds which have not been thoroughly investigated.

¹G. J. Beke, H. Veldhuis, J. Thie: Bio-Physical Land Inventory of the Churchill-Nelson Rivers Study Area, North-Central Manitoba. Canada-Manitoba Soil Survey, University of Manitoba, Winnipeg. June, 1973 P. 110-125.

One site that is unique to Manitoba is a native Cree dancing circle or religious ceremonial site, south of Wuskwatim Lake. Another site UNR 4, is believed to be an early European winter trading post. McGillivray's (1789-90) Rat River Fort Journal states that a North-West Company trading post was located on the southwest point of Threepoint Lake, the exact location of UNR 4. These types of sites can yield not only valuable information on the Early Historic contact period, but also have potential for recreational development.¹

Recorded sites run the gamut from possible Early Man to good Early Historic sites. The archaeological information collected to date has produced new and significant data on the early penetration into the area.

¹W. E. Wiersum: An Assessment of the Archaeological Resources of The Rat-Burntwood Diversion Area. Churchill Diversion Archaeological Project, Winnipeg, April 1973 p. 29

6.3.4 Climate¹

The study area has what has been termed by W. Koppen a continental climate. Temperatures range from 100°F in summer to -60°F in winter.

Daytime temperatures usually begin a warming trend in April and by mid-June the daily mean temperature has risen close to a comfortable 58°F. Hot, clear days and cool, clear nights are fairly typical of July and August, September and October can bring some of the most pleasant weather, but are generally cool and damp. The rest of the year finds the region firmly entrenched in winter and clear sunny days seem to be the norm.

Mean annual precipitation is about 17 to 18 inches with mean annual snowfall in the 45 to 50 inch range with degree days² being between 1200 and 1600. The frost free days number between 70 and 90 days and the ice free days about 163.

The summer temperatures in the study area can be considered conducive to the enjoyment of outdoor recreation activities. The cold winter temperatures can be a detriment but they can also be exhilarating with the use of proper winter clothing and the recent innovations in winter recreational equipment and facilities.

The water temperatures are high enough even on the large lakes during July and August for swimming and water sports from the scattered sand beaches.

Movement by boat on the lakes is possible by June 1, when only scattered ice floes remain.

¹T. R. Weir (ed) Economic Atlas of Manitoba, Department of Industry and Commerce, Winnipeg, 1960, p. 18.

²A degree day is a unit that represents one degree of declination from a given point (43°F) in the mean daily outdoor temperature.

6.3.5 Scenic Quality

Scenic quality or aesthetic appeal is a resource which greatly influences the recreation capability of an area. Just as there are varying economic values relating to the land surface so also are there varying scenic values.

Scenic quality is an immeasurable quality. Not only does scenic value vary between scenes but also within the same scene as well as within "the eye of the beholder". Appearance will change, depending on the mental attitude of the viewer, the weather conditions, and the light conditions.

Areas which may appear breathtaking and spectacular covered with a blanket of snow and in dazzling sunshine, on an overcast day may simply be cold and dismal. Marshes or swamps with drowned timber which in the full light appear as an eyesore, in the first rays of the morning sun with the outlines shrouded in rising mist take on an ethereal, ephemeral quality which is lost as the mist dissipates and the sun rises. A large beach area, backed by an impressive stand of trees will appear much more pleasant in full sunlight on a warm day than it does on a cold, wet overcast day.

It is possible, however, to objectively evaluate and compare landscapes as to scenic value by comparing directly measurable qualities such as changes in topographic relief and diversity within the landscape unit. Scenic value increases as the topographic relief increases. This can be measured from topographic maps and by on-site examination. As the diversity of a scene increases, so does its scenic value. Diversity is created when there is a mixed vegetation stand. This can be measured directly from forest inventory maps supplemented by site examination. Diversity is also created when another dimension is added to a landscape.

For instance, a scene composed of water, forest and sky would not have as great a scenic value as one composed of water, rock, sand beach, forest and sky.

In a study such as this, a scale for scenic value which could be applied to the landscape unit would assist in identifying the areas having the highest recreation capability. It could then be determined which areas would suffer the greatest loss in scenic value due to flooded timber, once the lake level was changed. A comparison could next be made with other lakes to determine which system would be the most compatible for hydro-electric development. Finally, after weighing scenic value along with the other components and constraints which determine the recreation potential of an area, suggestions could be made with regard to mitigation or enhancement practices such as pre-flood timber clearing or dyke building in the most suitable places.¹

By applying the preceding philosophy to the diversion route as well as the shoreline inventory types, it was possible to roughly rank the lakes in terms of scenery and those shorelines most conducive to recreational use. Those shorelines producing the necessary diversity and ease of use were the low bedrock shoreline and the bedrock shoreline with overburden beach.

The low bedrock shoreline produces an extremely irregular shore with many sheltered coves and embayments. The outcrops are generally wide, low, smoothly glaciated and have a water washed zone between 10 and 20 feet wide.

¹J. Lamb, W. Schick - op. cit. P. 54-56.

Lacustrine deposits make up the overburden which thinly covers the bedrock on the backshore. Drainage is generally good.

Shoreline vegetation is sparse, composed of grasses and weeds. This grades back to willow, alder and juniper which yields to coniferous forest.

The bedrock controlled shoreline is similar to the preceding type except there are no bare outcrops. Those that do occur are on the backshore zone. Over-burden beaches form relatively regular stretches of shoreline connecting the bedrock promontories.

The foreshore is normally a beach of granular material or clay backed by a low clay or till bank. The overburden thinly covers the bedrock in the backshore, slope is moderate.

Vegetation on the beaches is occasionally aspen, poplar, alder, willow, with grasses and sedge. Backshore vegetation is commonly mixed coniferous-deciduous forest of spruce, aspen, poplar.

The other shoreline types add scenic interest to an area if present, but the most important types for recreation are those described since they provide sheltered landing and camping areas with usable backshore and a diversity of texture and colour, ie: improved landscape diversity and aesthetic appeal.

The seven major lakes in the area were ranked according to the proportion of their shorelines in the described types. They are in descending order of attractiveness, Rat Lake, Wapisi Lake, Wuskwatim Lake, Pemichigamau Lake, Notigi Lake, Karsakuwigamak Lake and Threepoint Lake.

6.3.5.1 Threepoint Lake

The dominant shoreline characteristic is gently sloped alluvial shoreline. There is a steep initial rise of about 15 feet followed by a very shallow slope with poor drainage and muskeg conditions. This is associated with low willowed shoreline of horizontal profile and less than a foot rise from water level as far as 50 to 500 feet from the water's edge. Typically an offshore zone of marsh vegetation is present. There is a zone of closed deciduous forest from the water's edge to the first slopes. It is generally a zone of poor drainage and commonly of standing water in small pools.

There are about four miles of beach profile on the lake. These are fairly steep and narrow. They are usually bordered by large areas of pondweed, making them unattractive for swimming. These marshes can extend as far as 1000 feet from shore and make boating difficult. The lake is quite shallow and turbid and does not offer any outstanding scenery.

6.3.5.2 Karsakuwigamak Lake

This lake has a larger percentage of bedrock controlled shoreline although close to 45% of the shore is alluvial and low willow and there is only one small occurrence of steep bedrock shore.

The outcrops are wide and low with a moderate slope and are usually vegetation free. They present little difficulty in approach and usually provide shelter for small beaches in embayments. These beaches provide excellent landing areas and overnight camping spots although the usable backshore zone is extremely narrow with an understory of sphagnum and feather mosses.

6.3.5.3 Notigi Lake

The shoreline is composed almost 68% of the previously described bedrock controlled shoreline and about 22% is alluvial and low willow. There are also about 2 miles of steep bedrock shoreline on the north-west shore of the western lobe of the lake.

Due to this occurrence and the greater proportion of low bedrock shoreline on this lobe, the overall shoreline is fairly regular and does not have the very irregular embayed shore, characteristic of this type. The eastern lobe having an equal proportion of each type of shore, displays this irregular feature. Beaches are not common but some small ones exist in the embayments.

Much of the backshore of the western lobe has been burned over and is now covered with young regeneration forest of aspen and poplar. This has not yet obtained sufficient height or density to mask the charred stumps and skeletons of the burned forest which detracts from the aesthetic appeal of the lake.

6.3.5.4 Pemichigamau Lake

The shoreline is composed of approximately 70% bedrock controlled shoreline and about 30% low alluvial and low willow type.

The lake is characterized by the irregularity of the shoreline and the presence of many small cusp-shaped beaches at the backs of embayments protected by bedrock promontories. The scenic unspoiled beauty of this lake makes wilderness canoeing, camping and associated pursuits very enjoyable.

6.3.5.5 Wuskwatim Lake

Slightly over 72 % of the shoreline is bedrock controlled. The many sheltered embayments contain small beaches, and the outcrop shoreline does not offer too much difficulty of access. The backshore rises steadily from the lake and is covered with closed coniferous forest.

One of the most attractive areas on the lake is located along the portage which bypasses Wuskwatim Falls, tree cover, soil depth and the proximity to the falls offer an atmosphere of unspoiled natural beauty which is difficult to rival.

6.3.5.6 Wapisu Lake

Bedrock controlled shoreline makes up over 75% and is the dominant shoreline type.

The lake is formed in two lobes, one oriented roughly north-south and the other east-west. Almost all of the western shore of the upperlobe is bedrock outcrop shoreline which slopes gently to the water.

There are many small sand beaches which would make ideal campsites for boaters and fishermen. The lake is large but the numerous islands divide it into many sheltered bays which makes it a good area for canoeing and boating as there are few shoals or hidden rocks.

Wapisu Lake is very pretty and the scenery is varied which adds greatly to the recreation experience.

Much of the southern area has been burned over and is now clothed with regeneration forest of aspen and poplar. A closed coniferous forest dominates the backshore and those areas untouched by fire. The vegetation cover comes right to the shore and in those minor areas of alluvial shoreline some slumping has occurred.

6.3.5.7 Rat Lake

This lake is the most beautiful and scenically inspiring water body along the entire diversion route and possesses the greatest potential for recreational development and use of all the lakes. Over 85% of its shoreline is bedrock controlled and as a result, is very irregular with many bedrock promontories, embayments and small sand beaches at the back of the embayments. The shoreline is so irregular that the many islands divide it into five bay like sections. As a result, Rat Lake is well suited to wilderness camping and canoeing and is a joy to explore as the scenery and vistas change continuously as one rounds headlands or leaves the shelter of islands.

The other lakes in the system are merely widenings in the river. They are formed on thick lacustrine clays with banks 20 to 30 feet high. Permafrost in the banks is melting and undercutting due to wave action is causing the banks to slump. The banks are so active as to be free of vegetation and are unattractive for recreation use.

The river stretches between the lakes have their own scenic value which is mainly a factor of vegetation and bedrock causing falls or rapids.

6.3.5.8 Rat River

The Rat River from Issett Lake to Karsakuwigamak Lake is mainly low willow shoreline for about the first 10 miles below Issett Lake. It gradually changes to low bedrock which is higher than the willow and better drained. This grades back to the low willow. The bedrock zones usually have short stretches of rapids associated with them. The final zone before Karsakuwigamak Lake is alluvial shoreline of moderate height.

The bedrock is masked by a 3 to 6 feet deep deposit of alluvial material.

Between Karsakuwigamak Lake and Rat Lake, the river is bedrock controlled throughout in the vertical, and frequently in the horizontal. The channel shape is very irregular. The overburden is deep enough to mask details of the underlying bedrock topography. Small marshes are found in embayments where small tributaries join the main stream.

The bedrock controlled sections have a water washed zone some 10 to 15 feet wide, usually devoid of vegetation. Closed coniferous forest is prevalent behind the exposed bedrock.

Between Misinagu and Notigi Lakes about two miles of steep bedrock shoreline occur these areas have been burned over and the overburden washed off, they support only deciduous shrubs.

6.3.5.9 Burntwood River

At the exit of Threepoint and at the entrance to Wuskwatim, Opegano and Birch Tree Lakes are found alluvial shorelines. The rest of the shoreline is made up of bedrock outcrops and associated bedrock controlled shorelines of moderate relief.

Drainage is generally good, exceptions being the stretches of alluvium, and vegetation, except where burned over, is dense. The river is fast with several rapids and falls maintaining control of the flow.

There are five large waterfalls along this stretch of the river. The first, Wuskwatim Falls is at the outlet of Wuskwatim Lake. It is a magnificent cascade about 24 feet in height. Unfortunately, the portage bypassing them offers no good vantage point for viewing the entire falls. The fishing is excellent and the combination of tree cover, soil depth and proximity to the falls offer an atmosphere of unspoiled natural beauty that is difficult to rival.

The next falls are Taskinigup. These are as impressive as Wuskwatim. Again the portage is removed from the falls and follows a circuitous route mainly up and over bedrock protuberances. Access to the falls is possible, but at no time can the entire falls be seen. Even so, the unrestrained power can be felt as the water boils and tumbles over the rocks.

Between Opegano Lake and Birch Tree Lake are two more sets of falls. The first, Jackpine Falls is lower in height than Wuskwatim or Taskinigup and again a vantage point for good viewing is not available so that one must imagine the full sweep from the small portions that can be seen.

Kepuche Falls is reached next. These are a magnificent set, tumbling and roaring between sheer bedrock walls. Good vantage points are available for viewing and photography and the backshore vegetation is dense and well developed adding to the overall scenic quality.

Manasan Falls are the last set before Thompson. These are about 400 feet wide with a drop of approximately 25 feet. The portage is close to the falls and many good vantage points are available for viewing the entire spectacle and for photography.

Marsh areas are larger and more extensive than those found on the lower Rat. The zone of weeds extends sometimes 1000 feet.

Between Birch Tree and Apussigamasi Lakes, the river exhibits low relief with occasional outcroppings. The exception is Manasan Falls where bedrock is the dominant bank material.

The alluvial shoreline of this section is backed by lacustrine deposits covered with deciduous scrub backed by coniferous forest.

Drainage is moderate but frequently only fair.

Outcrop shorelines are fairly low, with water washed zones free of vegetation. The backshore is well drained and heavily treed.

From Apussigamasi Lake to Split Lake, the lacustrine deposits are deeper. The river has cut through to bedrock and the flow is controlled by it. Horizontal control is usually lacustrine.

Bedrock controlled shores are the most extensive. The banks are steep and well drained, and the beach usually associated with it is at times non-existent. The vegetation is regeneration forest.

Slumping shorelines exist at the upper and lower ends of this section. The backshore slopes well, and is covered with closed coniferous forest.

Some bedrock outcrops occur at control sections and have a heavier overburden than normal.

Mild sloped alluvial shoreline is rare and occurs only in two small embayments. The usual marsh areas are found in the back of embayments.

6.4 Transportation Infrastructure

Of the five settlements in the study area, only two - the City of Thompson and the Settlement of Nelson - will be significantly affected along the diversion route below Issett Lake.

The new extension of Provincial Road 391 connects Thompson with Leaf Rapids and Lynn Lake and a branch of this road extends south to Nelson House.

The dam and reservoir on the Rat River below Notigi Lake will flood certain sections of P.R. 391 in the vicinity, requiring the raising and re-routing of approximately 8 to 10 miles of the highway.

The Notigi dam will form the bridge for the relocated section as it swings south of the reservoir to rejoin the present road.

The extra flow in the Burntwood River combined with the reservoir formed by the Wuskwatim dam could produce water levels of 810 feet at Nelson House. This, from present information, would flood sections of the connecting road to P.R. 391 and make an island of the main area of the reserve. The present airstrip at Nelson House is above this level and will not be affected. The area used for float planes may be improved by more water over present hazards, but the flooding of small islands could present additional problems. All existing docks must be relocated to higher ground.

Water travel, both upstream and downstream, will be impaired by the dams, requiring longer more arduous portages around the structures.

At Thompson, the reservoir created by the Manasan Dam will flood approximately three miles of P.R. 391, about four miles north of Thompson. This will happen irrespective of any dyking program proposed by the Baracos-Galay report.¹

The C.N.R. branch line to Thompson is one-half mile from the river and it is highly unlikely that the railway line will sustain any adverse effects as a result of Hydro development.

The float plane bases on the Burntwood River, operated by Illford-Riverton, Lambair, and Manitoba Government Air Services will be adversely affected. All three will be required to move their present docking area and M.G.A.S. will have to relocate its office and maintenance buildings. Present forecasts indicate that over 50% of the present M.G.A.S. facility will be inundated.

¹ A. Baracos, V. Galay: Effects of Increased Flow in the Burntwood River Near Thompson, Manitoba. Water Resources Branch, Department of Mines, Resources and Environmental Management, Winnipeg, 1973. p. 25.

The Thompson airport is about fourteen feet above the suggested Manasan Forebay level. It has been suggested by the Baracos-Galay report that some dyking may be required near the southwest end of the airstrip to prevent any possibility of flooding of sections of the runway.¹

6.5 Resource Use

This section is a summary of resource use in the study area. The existence of these uses affects the allocation of recreation sites and must be considered in the formulation of the master plans.

6.5.1 Trapping

Fur Trapping, although declining in popularity, still produces a significant income in terms of subsistence economy for many people on the Nelson House Indian Reserve. For the 1970-71 season, fur trapping indicates a total value of \$36,774.13 for the furs collected at Nelson House.²

Furs are flown to Thompson and from this point are taken by rail to Winnipeg, or are flown directly to Winnipeg.

6.5.2 Commercial Fishing

Some commercial fishing is carried out on Rat Lake, Wapisu Lake and Wuskwatim Lake. This activity employs about 30 men from the community of Nelson House. The catch is about 50,000 pounds per year. The fish are flown to the Co-op plant at Leaf Rapids and taken by truck to Lynn Lake and by rail to Winnipeg.

6.5.3. Mining

Mining is an important resource industry in the Rat-Burntwood

¹K.A. Rosin, F.F. Saccomanno, S. Trachtenberg: Lake Winnipeg-Churchill River Diversion Transportation and Navigation Study University of Manitoba, Winnipeg, April 1973. p. 26ff.

²K.A. Rosin, et al. op. cit. p. 45.

Diversion study area. The Town of Leaf Rapids and the City of Thompson are both heavily dependent on nickel mining.

The Ruttan Lake mine is several miles from the forebay, and the mining operations at Thompson are south of the city and as such, beyond the area to be inundated by the Manasan control structure.

Potential mining operations are dependent upon the economic viability of any ore body which may be brought into production. From existing reports, it would appear that the area affected by flooding does not contain any significant mineral finds which would warrant exploitation now or in the future.¹

6.5.4. Sport Fishing

Within the study area, sport fishing has been limited due to access problems. From personal observation and conversations with local fishermen, it would seem that commercial fishing on the lakes was curtailed due to the preponderance of jackfish (*Esox lucius*) caught. This fish apparently has less commercial value and is not desired by the native fisherman. However, large jacks are highly prized by sport-fishermen, especially visitors from the United States.

Fishing in the many sets of rapids usually produces good catches of pickerel (*Stizostedion vitreum*) and the pools above and below rapids and falls yield jacks 13 to 14 pounds and over. The lakes in the system also produce large jacks and fishing along rock shelves or at the face of bedrock walls will usually produce pickerel in the 2½ to 3 pound range.

From the existing potential recorded in a very limited personal survey, it would appear that potential exists in the diversion route for a substantial sport fishery.

¹Ibid. p. 44

A more positive statement might be made if more information on populations were available. While sport fishing on a limited basis is very successful at the present time, it remains to be seen if more intensive utilization will deplete the resource to the point where only very small fish are taken.

6.5.5 Hunting

Hunting is again limited, due to access. The main hunting pressure comes from the local native population for meat. This does not appear to be an intensive use, but of a sporadic nature as the urge strikes to go hunting.

From personal observations made while canoeing through the area, there would appear to be a fair moose population and existing habitat appears good.

Local waterfowl populations are reported to be large and their use is limited to sporadic hunting by the local residents.

6.5.6 Quarrying

Present quarrying operations within the study area are limited. Local gravel was used to surface the airstrip at Nelson House. The only other quarries are located near Thompson.

Localized sand and gravel deposits near P.R. 391 were used for highway construction and sand and gravel were stockpiled at strategic locations, along the highway. These localized deposits will also likely be used for construction of the hydro project.

6.5.7 Forestry

Present forestry operations are limited to local needs for building materials and fuel.

Churchill Forest Industries (now Manitoba Forestry Resources Ltd) of The Pas holds a license to cut merchantable timber in the study area. However, at present there are no operations.

The potential merchantable timber lies along the Rat-Burntwood Diversion route. An estimated total land area of 101,484 acres and a gross merchantable volume of 294,650 cunits will be lost in the Rat River watershed due to flooding by the Churchill River Diversion Project. This translates into 25,000 to 35,000 cords per year. The chief detrimental effect to forestry, loss of 2.6 per cent of the productive forest land in the Forest Management Units involved, will be partially off-set by improved access to the area during development of the hydro project.¹

Another 100,000 acres will be inundated from Threepoint Lake to Thompson as a result of the proposed dams on the Burntwood River. This, however, means the loss of only some 6,000 cords.

6.6 Recreation Capability

The entire length of the diversion route from Issett Lake to Thompson in its natural state is ideally suited to wilderness canoeing, camping, fishing, hunting, nature study and photography.

Minor limitations to widespread use exist, such as water too cool for comfortable swimming and limited accessibility. These are, however, not serious and serve to enhance the area for wilderness recreation use.

The Rat River is for the most part narrow and placid, the placidity broken occasionally by small sets of rapids which test the skill of the canoeist and add excitement to the journey. The intervening lakes provide some magnificent scenery and a break from the riverline landscape.

¹A. Whidden, R. Lamont, M. Kaye. Forest Resources of the Rat-Burntwood Diversion Area. Forestry Branch, Dept. of Mines, Resources and Environmental Management. Winnipeg, March 1973. p.i.

Various trappers' cabins still in use or abandoned, riverside grave sites smoking racks and tent frames, add a very picturesque rustic quality to the surroundings.

Wildlife is plentiful and easily seen when canoeing on the river. Moose browsing in the marsh edge, lynx, beaver, muskrats and otters can be seen and one can glimpse the occasional wolf as it quietly fades into the forest. Ducks explode from the marsh ahead of the canoe and the sight of a solitary hunting eagle is a vision that few southerners have ever seen.

Slowly gliding down the river overhung with willows and trailing vegetation produces a peaceful euphoric calm which can seldom, if ever, be equalled in the cacaphonic clamour of the city.

Provincial Road 391 from Thompson to Leaf Rapids and Lynn Lake crosses the study area and has greatly improved access. The river crossings of the Footprint River, the Rat River and the Suwannee River have made Footprint Lake, Threepoint Lake, Notigi Lake, Wapisu Lake and Rat Lake accessible by boats larger than a canoe and have reduced the necessity for float plane access.

6.6.1 The Diversion Route

Issett Lake is the headwater of the Rat River and is located some 10 miles south and west of South Bay on Southern Indian Lake. It is called Mud Lake by the local inhabitants and is aptly named. It is a shallow reedy lake, the shoreline is low and is generally not suited to camping. There are only two suitable campsites on the lake, both just north of the exit of the Rat River. Natural water level fluctuations are large and the midsummer level is some three to four feet below the spring stage.

The relief is low and is seldom more than 5 feet above water level as far as 50 to 500 feet from the water's edge. An offshore zone of marsh vegetation is typically present, the width of the zone being dependent upon the foreshore slope. The shoreline is composed of boulders in many places.

The Rat River between Issett Lake and Karsakuwigamak Lake is narrow and slow flowing with three small sets of rapids, only one of which has to be portaged.

As one approaches Karsakuwigamak Lake, the vegetation gradually changes, the large stands of spruce give way to poplar and birch along the river, with spruce predominant around the lake.

Karsakuwigamak Lake is also shallow but has a particularly absorbing beauty. The shoreline is generally bedrock controlled with the outcrops wide, low and smoothly glaciated, with a water washed zone of 10 to 20 feet. Drainage is generally good. Campsites are difficult to find and are generally very narrow, backed by closed coniferous forest.

The river area between Karsakuwigamak Lake and Pemichigamau Lake is bedrock controlled throughout in the vertical and frequently in the horizontal. Here, tall majestic spruce are found, and beneath them are excellent campsites. The dense growth and thick foliage of the trees have retarded growth of the usual underbrush tangle.

Pemichigamau Lake has low lying areas broken by higher rock banks. The areas of bedrock shoreline are usually associated and small cusp-shaped beaches are found in embayments sheltered by bedrock outcrops. These beaches are usually narrow, but make excellent landing and camping sites. The scenic unspoiled beauty of this lake makes wilderness canoeing, camping, and associated pursuits very enjoyable.



PLATE 1 Boulder shore-
line Issett Lake.

PLATE 2 Rat River 1/2 mile
downstream from
Issett Lake, water-
fowl habitat.

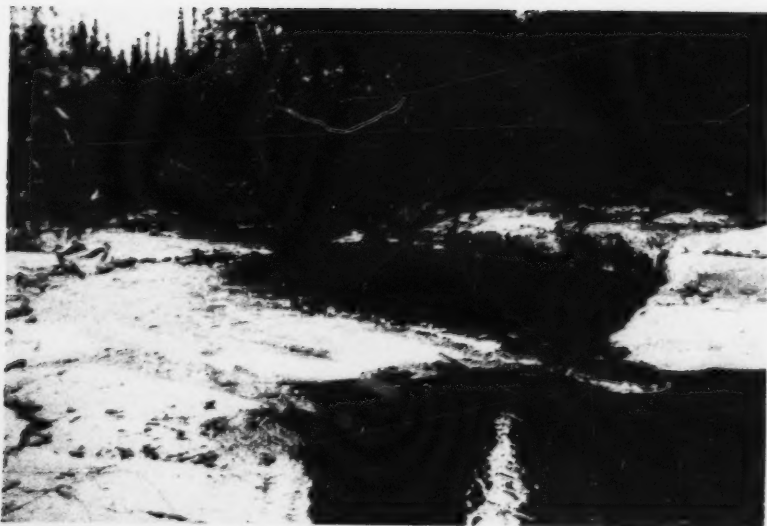


PLATE 3 Third set of rapids
on Rat River.



PLATE 4 Third set of
rapids on
Rat River.



PLATE 5 Rat River showing
low elevation of
backshore.



PLATE 6 Rat River wide marsh
two miles downstream
from Issett Lake.



PLATE 7 Rat River below
junction of
Missipaskiow River.



PLATE 8 Grave sites on Rat
River one mile up-
stream from Lake
Karsakuwigamak.



PLATE 9 High granite face
Pemichigamau Lake

Rat Lake is the most beautiful and scenically inspiring water body along the entire route and possesses the greatest potential for recreational development and use of all the lakes. The shoreline is very irregular and the islands and the mainland are virtually indistinguishable. The many islands divide the lake into five baylike sections. Shelter is available from every direction and there are many fine beach areas. As a result, this lake is well suited to wilderness camping and canoeing and is a joy to explore as the scenery and vistas change continuously as one rounds headlands or leaves the shelter of islands. It could also be ideally suited to commercial lodge use if the fishing was proven to be good.

Misinagu Lake is little more than a widening in the river channel. The entire lake shore is high, jutting outcrop and is unsuited to camping.

The Rat River between Misinagu Lake and Notigi Lake is the most difficult stretch of water along the entire Rat River. Three large and spectacular sets of rapids occur along this stretch, and the portages to bypass them are rough and arduous. Campsites are easily found along the portages if one wants to enjoy the white water and sample the fishing.

Notigi Lake is long and narrow and is formed in two lobes, one trending east-west, the other north-south. The eastern lobe has a more irregular shoreline and small beaches exist in the embayments.

The western shore of the north and south trending lobe has been burned over and is now clothed with young regeneration forest of aspen and poplar. This has not yet obtained sufficient height or density to mask the charred stumps and skeletons of the burned forest which detracts from the aesthetic appeal of the lake.



PLATE 10 Campsite sand beach
Pemichigamau Lake.



PLATE 11 Pemichigamau Lake
typical rock
shoreline.



PLATE 12 Rat Lake rock
shoreline.



PLATE 13 Rat River rapids
and falls two
miles upstream from
Notigi Lake.

PLATE 14 East Notigi Lake
typical shoreline.

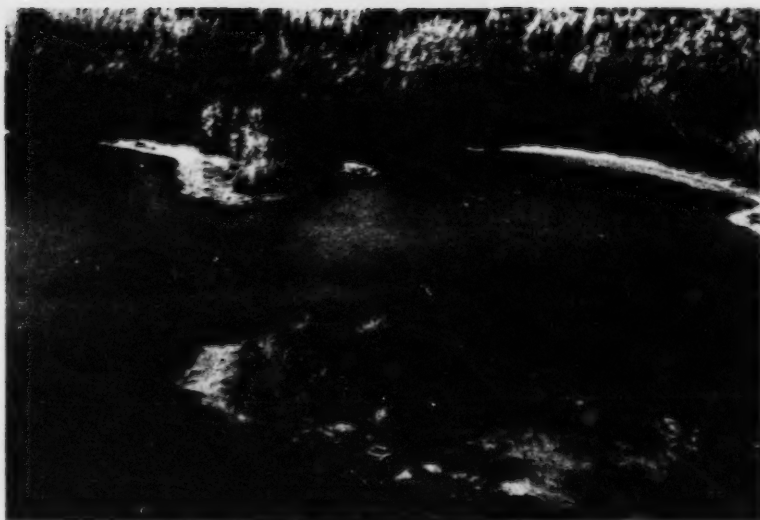


PLATE 15 Beach Wapisu Lake.

A good sand beach exists at the southern end of the lake at the site of a former hydro camp. Development possibilities exist here as the backshore is level and the vegetation cover is good. Removal of the abandoned buildings and cleaning up the area could make it suitable for a campsite, although the garbage dump on the island opposite the site is an eyesore. It could also possibly be developed as an historic site as it is the site of a particularly significant archaeological dig.

Notigi Lake is again well suited to canoeing, camping, fishing, hunting and photography. Boating is also possible as the lake will be accessible via the crossing of the Rat River by Provincial Road 391.

There are two sets of rapids between Notigi and Wapisu Lakes. The first must be portaged but the second can be run by experienced canoeists.

Wapisu Lake is actually two lakes joined by a narrow channel. Almost all of the western shore of the upper lobe is bedrock controlled shoreline which slopes gently to the water.

There are many small sand beaches which would make ideal campsites for boaters and fishermen. The lake is large but the numerous islands divide it into many sheltered bays which makes it a good area for canoeing and boating as there are few shoals or hidden rocks.

The lake is very pretty and the scenery is varied which adds greatly to the recreation experience.

Much of the southern area has been burned over and is now covered with regeneration forest of aspen and poplar. A closed coniferous forest dominates the backshore and those areas untouched by fire.

The vegetation cover comes right to the water's edge and in those minor areas of alluvial shoreline some slumping has occurred.

This lake will also be made accessible by the P.R. 391 crossing of the Rat River. There is also the possibility that it could be used as an outcamp for a commercial lodge operation organized at Nelson House.

A short stretch of the Rat River joins Wapisu and Threepoint Lakes. There are three areas of fast water along this stretch, but all can be navigated without difficulty.

Threepoint Lake is very shallow and reedy. There is a steep initial rise of about 15 feet, followed by a very shallow slope with poor drainage and muskeg conditions. Typically an offshore zone of marsh vegetation is present which may extend 1000 feet from the shore.

There are several beaches on the lake, but they are usually bordered by large areas of pondweed, making them unattractive for swimming.

The lake itself is shallow and quite turbid from the mixing of the waters of the Rat, Footprint, and Burntwood Rivers. There are large areas of pondweed and other weeds which makes boating difficult. The lake does not offer outstanding scenery. There is, however, a North West Company trading post on the lake which will be undergoing archaeological investigation and could prove to be a significant historical site.

Leaving Threepoint Lake, the Burntwood River system is entered. There has been heavy burn along the Burntwood, with erosion of the exposed soils by runoff; this makes the Burntwood River appear much different than the Rat River. There are three sets of rapids between Threepoint Lake and Wuskwatim Lake; all must be portaged.



PLATE 16 Granite rock face
Wapisu Lake.

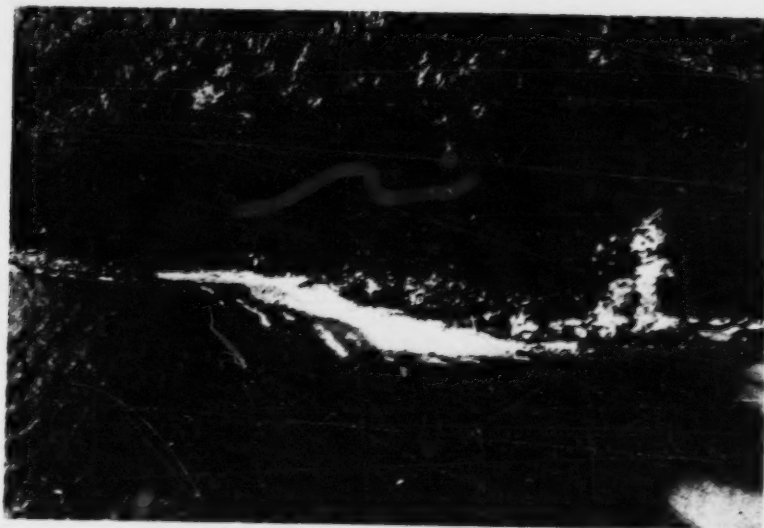


PLATE 17 Wapisu Lake beach.



PLATE 18 Granite cliff
Wapisu Lake.



PLATE 19 Threepoint Lake
slumping shoreline.



PLATE 20 Threepoint Lake
small camping
area



PLATE 21 Cabins at mouth of
Footprint River on
Threepoint Lake.

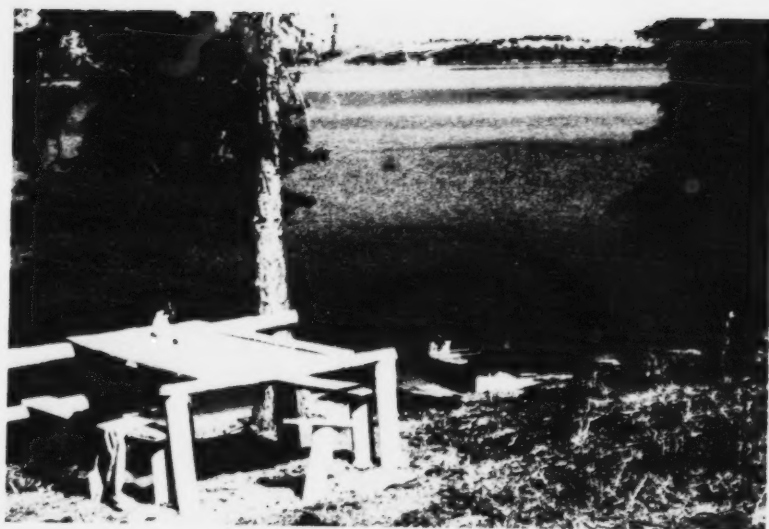


PLATE 22 Beach and park
developed on
Footprint Lake,
Nelson House in
the background.

PLATE 23 "Footprints" on
Footprint Lake.



PLATE 24 Rock formation
Footprint Lake
known as the house (L)
and canoe (R) of
legendary being named
Whiskey Jack.

Wuskwatim Lake is extensively bedrock controlled. The many sheltered embayments contain small sand beaches and the outcrop shoreline does not offer too much difficulty of access. The backshore rises steadily from the lake and is covered with closed coniferous forest.

One of the most attractive areas on the lake is located along the portage which bypasses Wuskwatim Falls. Here tree cover, soil depth and the proximity to the falls offer an atmosphere of unspoiled natural beauty which is difficult to rival.

This lake is ideally suited to wilderness use for canoeing, camping, fishing, nature study and photography.

Below Wuskwatim Falls are Taskinigup Falls. These are as impressive as Wukwatim. The portage around the falls is very uneven and arduous for the most part, over bedrock protuberances. These two sets of falls are undoubtedly the highest between Issett Lake and Split Lake. They are, however, not the best for scenery or photography because it is difficult to gain access to them. The portages are circuitous and there are no vantage points from which all of the falls can be seen at once.

Beyond Taskinigup Falls is a long fairly quiet stretch of river. There is one set of rapids before Opegano Lake, Little Jackpine Rapids; these must be portaged to reach Opegano Lake. The portage is long and not clearly marked as it runs mainly over exposed bedrock. There are good campsites available at both ends of the portage.

Opegano Lake is similar to a pothole and sits on deep level lacustrine deposits. It is little more than a widening in the Burntwood River. Wave action is actively eroding the shores and combined with melting permafrost, it causing extensive slumping of the 20 to 30 feet high clay banks. The banks are steep and active enough to be free of vegetation.



PLATE 25 Early Morning
Rapids Burntwood
River

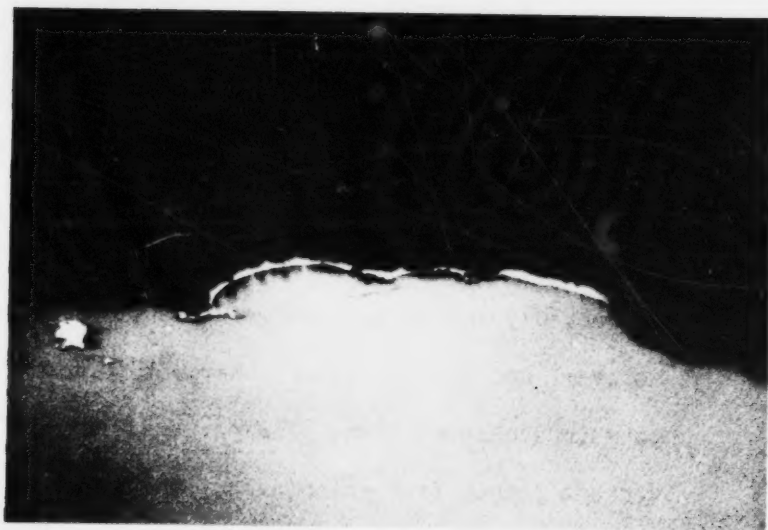


PLATE 26 Beach on
Wuskwatim
Lake.



PLATE 27 Aerial Wuskwatim
Lake, Wuskwatim
Falls, Taskinigup
Falls.



PLATE 28 Wuskwatim Falls



PLATE 29 Taskinigup Falls



PLATE 30 Kepuche Falls -
Burntwood River.

Between Opegano and Birch Tree Lakes are two spectacular sets of falls separated by a set of rapids. The first set of falls is Jackpine Falls and must be portaged. The rapids, Upper Kepuche Rapids are only about a mile downstream and everything must again be unloaded to be portaged. Kepuche Falls are reached next. These are a spectacular set tumbling between sheer bedrock walls. Good vantage points can be gained for viewing and photography. Campsites along all three portages are small but heavily used.

Birch Tree Lake is similar to Opegano Lake. Little more than a widening in the river, it is shallow with actively slumping clay banks.

Manasan Falls is the last obstacle before Thompson. These are a magnificent set of falls with a drop of approximately 25 feet. The portage is close to the falls and viewing points are readily available at the top and foot for a clear view of the entire falls. This area, only six miles by water from Thompson, would make an ideal boat-in picnic area to serve the residents of Thompson. The area could also be made accessible by car and foot via a road through or around the Birch Tree Mine. The end of the road would be connected by a footbridge across the Burntwood River to a footpath which would lead to the picnic sites and viewing areas near the falls. It is a significant enough site to deserve preservation as a Provincial Heritage area.

The Burntwood River at Thompson is extensively used for recreation purposes. Above the bridge is a waterski jump and this section of the river is heavily used by waterskiers for practice, competitions, displays and instruction purposes. A town park has also been constructed on the banks of the river with camping sites and picnic sites.



PLATE 31 Aerial Manasan Falls,
Birch Tree Mine in
background.



PLATE 32 Aerial Manasan
Falls



PLATE 33 Manasan Falls.

Below the bridge, the river is used extensively for powerboating and Mystery Lake below Thompson is used for fishing and primitive camping. People also go as far as the rapids below Thompson for day outings. In the winter, the river ice surface is used for snowmobiling and many events during the winter carnival.

From Thompson to Split Lake, the Burntwood River is relatively placid and only four portages are required in a distance of 50 miles. These portages are easy to locate and easy to cross. The scenery is not spectacular but the relative placidity and long stretches of quiet river come as a relief after the grueling trip between Nelson House and Thompson. A side trip can also be made to explore Mystery Lake which has some very nice scenery and good fishing and camping sites.

6.6.2 Importance of P.R. 391

The completion of P.R. 391 from the City of Thompson to the mining towns of Leaf Rapids and Lynn Lake and the connecting road to Nelson House will have a profound impact on the recreational resources of the area. For the first time, the area will be easily and economically accessible by road rather than charter or scheduled air flights.

The recreational and natural resources of this northern area will be made available to the motorist and the family vacation rather than limited to those who can afford expensive charter flights.

The new highway itself traverses the study area at only one point as it crosses the Rat River. However, it crosses and interrupts the drainage system at many points along its route and crosses river systems which make the study area accessible by boat. These other crossings are outside the technical geographic limits of the study, but are important for their regional recreational significance.

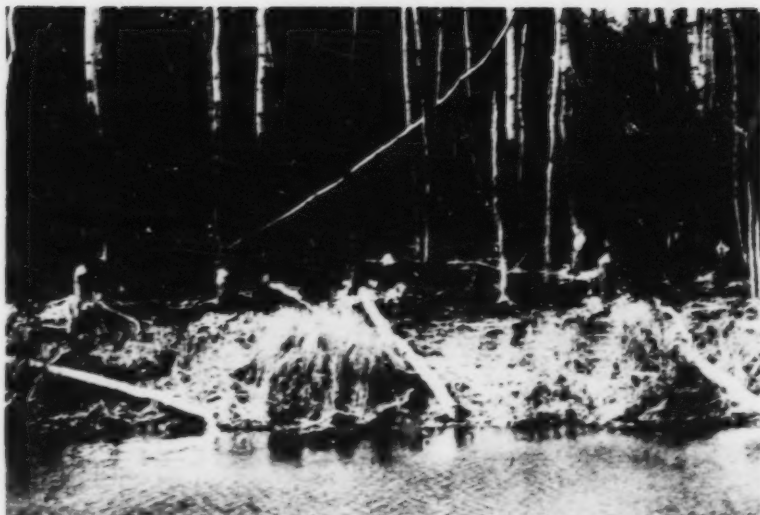


PLATE 34 Evidence of beavers
Manasan River.



PLATE 35. Twilight Waterski
Club Burntwood
River.



PLATE 36 Boat Launch area,
float plane bases
Burntwood River.



PLATE 37 Fishing at
Thompson
bridge.

PLATE 38 Burntwood River
below Thompson.



PLATE 39 Rock shore
Mystery Lake.



PLATE 40 Aerial beach
Mystery Lake.



PLATE 41 Expanse of beach
Mystery Lake.

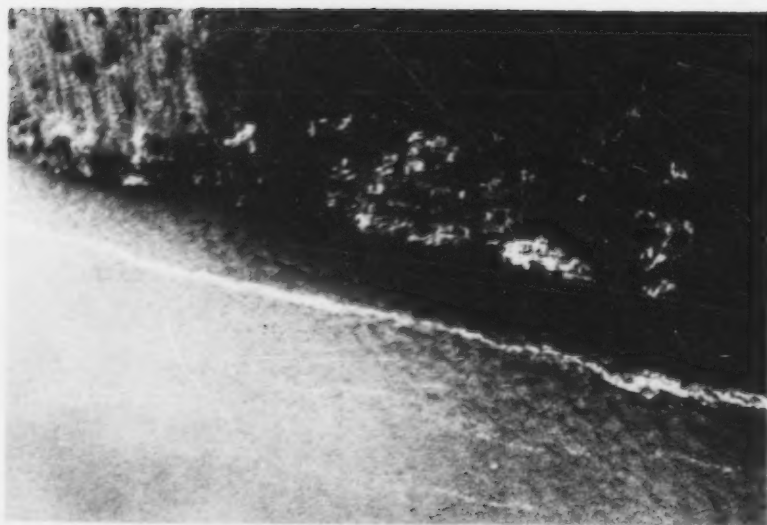


PLATE 42 Rock shore
Burntwood River
below Mystery
Lake.

Although at a cursory glance the crossing areas appear to make only those lakes immediately adjacent to them accessible, a more intensive study indicates that the entire river system and all of the connecting tributaries and lakes are open to the intrepid adventurer who is looking for true wilderness camping and canoeing experience.

The point where P.R. 391 crosses the Footprint River is a good site for a wayside with a limited camping opportunity. The Footprint River is large enough for power boating, but canoeing would be a more rewarding experience. To the south, lie Footprint and Threepoint Lakes and the Rat-Burntwood River system. To the north, is Sawbill Lake¹ and via a couple of portages, Little Footprint and Leftrock Lakes.

At the crossing of the Rat River, is an excellent location for a commercial operation. This point is approximately midway between Thompson and Leaf Rapids and would be a good location for a gas station, restaurant, motel with canoe rental and outfitting for wilderness canoe trips on Wapisu and Notigi Lakes.

The Suwannee River crossing would make Rat Lake accessible by canoe. The Suwannee River itself is narrow and shallow and is not suited to power boating. It is, however, an excellent river for canoeing. A small wayside is being constructed near the crossing site to make this opportunity available to persons using the highway.

With the Nelson House Indian Reserve connected by road to Thompson and P.R. 391 south, two opportunities exist for recreational opportunities which could be developed as a basic industry for the Nelson House Indian Band.

¹Local name used by residents of Nelson House.

One is the form of a commercial lodge operation offering a family vacation-type opportunity. This could be located on reserve land or off the reserve on the north arm of Footprint Lake near the entry point of the Footprint River. It would offer rental cabin units or a motel type accommodation. Guides and boats would be available for fishing, hunting and camping trips; outcamps would be located on Wapisu Lake. A certain percentage of the enterprise would have to be based on package vacations to remain viable, the rest from visitors travelling the highway.

The second opportunity would be the establishment of the reserve and surrounding attractions as a living history museum. This would be one of the best ways to preserve traditional skills, restore and maintain the Indians' self-esteem and pride in their ancestry. A living history museum would broaden the already rich recreation base available to the vacationing public in northern Manitoba.

This facility would be patterned after the facility based around Ma Kemp's loghouse at Berens River. A museum would be located in conjunction with the motel operation and would trace the history of the fur trade and The Bay's part in it. From the museum, a motor launch would take visitors on a tour of Footprint Lake. The first stop would be the footprints in the rock after which the lake is named and the legend connected with them. The launch would then take a scenic tour of the lake and proceed down the Footprint River to Threepoint Lake. Here a North West Company trading post exists on the southwest point of the lake. Suitably reconstructed and furnished, it would become a significant historical site. Exhibits within the fort would include the various steps in processing furs. The launch would then proceed back to Footprint Lake where a demonstration of traditional fishing methods would be given. The boat

would dock for a visit to the handicraft factory set up on the reserve and an opportunity to buy local Indian handicrafts. A shore lunch on the beach, across from the reserve would culminate the trip. This would include beans, fried whitefish and bannock. The launch would then return to the motel-museum area. The trip would be run twice a day adding a valuable attraction to the recreational opportunities of the area. Siting as many of the attractions as possible off the reserve proper would also serve to disrupt as little as possible the normal day to day life of the settlement.

The two opportunities could be operated independently or co-operatively. The co-operative venture would seem more feasible for a family vacation resort as there would be something for the family to do when the husband went fishing.

The economics of this enterprise would require capital investment (for the motel, restaurant, furnishings, the museum building, the launch boats, motors, fuel, the handicraft factory and supplies (hides, sewing machines, needles, thread, beads, scissors) of about \$1,000,000.00.

(Annex 1)

Estimating a vacation traffic in the range of 106 vehicles per day over a 96 day season would mean 35,616 vacationers using the new highway by 1980. There would also be an estimated 48,384 local northerners.¹

6.6.3 Commercial Lodges

For commercial lodge operation in remote areas, a sport fishery

¹Personal communication Research and Statistics Branch, Department of Tourism, Recreation and Cultural Affairs.

must meet one or more of the following criteria to attract significant participation:

- (a) Provide lake trout with good catch per unit effort and/or trophy sizes.
- (b) Provide northern pike at trophy sizes.
- (c) Provide walleye with exceptional catch per unit effort.
- (d) Provide good alternative activity options.¹

The lakes on the diversion route cannot meet the first criterion as they are not deep enough to provide habitat for lake trout. Commercial fishing if carried out on Rat Lake, Wapisi Lake and Wuswatim Lake would make the second condition difficult to meet. Walleye would appear to be plentiful at rapids, but they have not been fished intensively, and there is no information available on which to base estimates on the pressure they could stand before extensive restocking was necessary.

The fourth criterion is also difficult to meet for a fly-in lodge in this area. Hunting would be possible in season but there are few other alternative activities that a person paying \$500 to \$600 a week would participate in.

If, however, the lodge was geared toward a family-oriented vacation with camping, fishing, and canoe trips, several sites within the area are ideally suited. Rat Lake, the Reading River areas and Wapisi Lake are well suited to this type of operation. The lakes while not producing trophy fish, do provide good catches in the three to four pound class. These lakes are also well suited to boating, having numerous islands and sheltered coves and bays. Camping is also possible on the frequent small sand beaches

¹G.D. Koshinsky. Fisheries - Limnology Outlet Lakes Area. Fisheries Service, Winnipeg, March 1973, p. 68.

or smooth rock outcrops. Although the water is generally cool throughout the year, swimming is possible from the many beaches. The opportunities are many and varied for wildlife viewing and photography, as the scenery is magnificent.

Road access to the area should make the opportunity for the family vacation oriented resort more attractive and could provide the means for a significant recreation opportunity.

6.6.4 Waysides

The presence of a new highway through wilderness will dictact the provision of wayside stopping areas for travellers using the road. Vacation traffic on the road is not expected to be heavy and most trips will be made by people living in the region, either Thompson, Leaf Rapids or Lynn Lake.

Waysides were intended as a place to stop for a short rest on a long driving trip. In the north, however, the philosophy of the wayside is changing to provide not only a convenient stopping place where the weary traveller can picnic and be refreshed, but also a limited one or two day camping experience. It makes very little sense in most of the north to prohibit camping at waysides and to force a person to drive 30 or 40 miles to a designated camping area or a town where he can obtain accommodation. If the person has stopped for a short time and found the fishing particularly good and wishes to stay for a day or two, there is no reason why he should not be able to do so.

Provincial Road 391 on its route from Thompson to Lynn Lake passes close to several small lakes and crosses rivers where these wayside campgrounds could ideally be located. There are also areas where a small pull-off for viewing purposes could be located. In these areas, access to the

water body would be restricted by a natural feature such as a marsh or steep gully so that the scenic value would not be lessened by an access road or cleared shoreline.

6.6.5 Campgrounds

Structured campgrounds in the northern region cannot be isolated from nearby population centres due to the management and maintenance necessary to keep them in usable condition. The more highly serviced and structured a campground becomes, the more closely tied to the population centre it becomes.

Within the area of the present study, the major population centres are over 132 miles apart. This would mean that any campground established at an area such as the Notigi Dam site would also require the setting up of the necessary support and maintenance facilities since facilities at Leaf Rapids or Thompson would be about 65 miles distant.

The complaint from Thompson residents concerning the Paint Lake Provincial Recreation Area is that it is overcrowded and lacks sufficient level of development. The people do not want to rough it to the degree that the level of development of the park is forcing them to.

If distances are too great to maintain the campground at Notigi from Thompson, then it could be feasible to allow a commercial operator who would operate a service station-restaurant facility to construct a campground plus rental cabin units. This would provide the needed facility, supervision and maintenance while taking the setup and costs away from the public sector. This, of course, would mean less control by the province but it is one means of providing a necessary facility with the level of service deemed necessary by the people who would be using it.

6.6.6 Recreation Near Population Centres

Centres of population concentration be they mining towns, industrial centres or Indian settlements require some area where the residents can go for relaxation and diversion.

The main population centres of the study area are South Indian Lake, Nelson House, and Thompson. South Indian Lake and Nelson House are Indian communities while Thompson is becoming the regional service and administration centre for northern Manitoba.

Thompson area residents are already well supplied with outdoor recreation facilities located at Paint Lake Provincial Recreation Area just 20 miles south of the city, and additional facilities located on the Burntwood River. The local golf course is being gradually expanded to 18 holes and there is a ski area at Mystery Mountain, twelve miles north of town. The main complaint Thompson residents have with the Paint Lake Provincial Recreation Area is that the level of development is not high enough. The people do not want to rough it and are demanding a higher level of development including electricity, water and sewage hook-ups for trailers.

Many people would say that an Indian Reserve does not require structured recreation services. They would argue that the Indian lives in a state of nature and every day, does and takes for granted activities which the white man travels hundreds of miles to do, and spends hundreds of dollars to pursue. In a sense this is right; the Indian does have the entire outdoors at his disposal and for this reason has no need for structured campgrounds and marinas.

This general view has proven to be false, for the residents of both South Indian Lake and Nelson House on their own initiative have developed beach and picnic areas for their own use, and as they abandon their traditional way of life and become more enmeshed in the work-wage society, they begin to do things for pleasure and relaxation that had previously been considered as work. Since most reserves in the north are in a wilderness environment, it is necessary to maintain this natural condition for the use of the residents, whether it is for recreation purposes, or to maintain the last vestiges of their traditional means of earning a living.

There is also the opportunity for Indian Reserves to make use of the wilderness environment and the recreational capabilities of their land by subdividing land for cottages and then building and operating the cottages as a resort. This is a means whereby management and technical skills can be taught while operating an enterprise profitable to the reserve.

6.7 Outdoor Recreation Opportunities Without Hydro

This section is a comprehensive description of the recreational opportunities available within the study area. These opportunities were arrived at after a thorough assessment of the natural resources and on-site examination of the area. There follows a listing of the available opportunities, the constraints, and suggestions for such developments as would be needed to maximize the recreation opportunity.

The entire Rat-Burntwood River system in its natural state is an excellent river for wilderness canoeing, camping, fishing, nature study and photography. The route from Issett Lake to Thompson is the most

interesting and beautiful due to the rapids and falls and many chain lakes. The route below Thompson to Split Lake is much easier to traverse as there are only four sets of rapids in 50 miles. The portages are easy to find and traverse.

Rat Lake with its many islands, sheltered bays and magnificent natural beauty would be an excellent site for a commercial lodge operation offering package fly-in fishing trips. It offers the necessary isolation and the fishing especially for pike, is excellent.

A wayside being constructed at the time of report writing at the Suwannee River crossing of P.R. 391 will also make Rat Lake accessible by canoe from the road.

A commercial operation of a gas station/restaurant is also possible at the Rat River crossing. A boat launch provided here would make both Notigi Lake and Wapisu Lake accessible for boating, camping, and fishing. Fishing on both of these lakes is excellent and camping sites are readily available.

With road access to Nelson House via P.R. 391, the Nelson House Indian Band could operate a family vacation oriented resort combined with a living history museum. Outcamps for fishing could be set up on Wapisu Lake.

Another wayside site exists at the Footprint River crossing. A boat launch here would make Footprint Lake, Threepoint Lake, Wapisu Lake, Sawbill Lake and Little Footprint Lake accessible by powerboat.

Manasan Falls is a site possessing provincial scenic significance and should be designated as a Provincial Heritage Park. Boat-in picnic areas could be developed and viewing trails established on the river

banks opposite the Falls. Only footpaths would be developed as access to the Falls themselves.

The Burntwood River above Thompson is used extensively for water-skiing and a small local campground and picnic area are being developed on the banks. Below Thompson, the river is used for powerboating, and Mystery Lake is used for fishing and limited boat-in camping. The first set of rapids downstream from Thompson could also be developed as a small boat-in picnic site.

6.8 The Hydro Proposal

Manitoba Hydro in its Churchill River Diversion Project will divert the flow of the Churchill River to a maximum of 30,000 cfs. down the Rat and Burntwood River system. In order to do this, the outlet of Southern Indian Lake at Missi Falls will be dammed and a diversion channel dredged from South Bay on Southern Indian Lake to Issett Lake at the head of the Rat River. To take advantage of this extra flow for eventual power production, a series of dams are planned on the Rat-Burntwood Rivers.

The first of these dams on the Rat River below Notigi Lake will completely close off the Rat River by May 1, 1974. Until August, 1975 the level behind the dam will be allowed to rise to elevation 830 feet. In June, 1975 the North Channel at Missi Falls will be closed to allow the level of Southern Indian Lake to rise to 847 feet, an increase of about 10 feet. In August, 1975 there will be a controlled opening of the South Bay Channel Lake and by approximately November 1975 the level of Southern Indian Lake and the diversion route to Notigi Lake will be 847 feet. The Notigi structure will then be gradually opened to eventually release a continuous flow of 30,000 cfs.

The Long-range project also calls for a dam at Taskinigup Falls below Wuskwatim Lake; this will raise the level from 760 to 810 feet. A third dam is proposed for Manasan Falls, just above Thompson and First Rapids just upstream from Split Lake. These will all create extensive forebays which will create severe ecological damage.

6.9 Changes in the Resource Base

With the implementation of the Churchill River Diversion Project, the mean flows of the Rat River and the Burntwood River will be increased by eight and six times, respectively. The flooding behind the dams will result in the inundation of over 200,000 acres of shoreline, destroying countless beaches, acres of wildlife habitat and the shore zone which is important for camping. Flooded dead standing timber along the shoreline, floating debris cluttering the shore and the clearing necessary for hydraulic purposes will create a highly unnatural shoreline which could take some thirty to forty years to re-establish.

The rise in water levels of some 35 feet along the diversion route will submerge rapids and waterfalls, and will result in a complete negation of the canoe route and the wilderness recreation potential of the area.

Rat Lake, one of the most beautiful lakes along the route, and the one having the greatest potential for outdoor recreation will have an extra 30 feet of water in it as its level rises from 817 feet to 847 feet. This will destroy its value as a lodge site and make it worthless for wilderness canoeing, photography and nature study.

The level of Notigi Lake will rise approximately 36 feet from 794

to 830 and destroy the significant archaeological site at the south end as well as the lake's scenic potential.

With the increased flow, levels on Footprint Lake will rise from 790 to 804 feet. This will negate much of its value as a living history museum. The footprints will be covered, the beach area and shoreline flooded, reducing the scenic value, and the trading post location on Threepoint Lake will be flooded negating reconstruction on its original site.

The construction of a weir on the Footprint River between the lakes, to maintain Footprint Lake at its present level would still see the trading post location destroyed and this would have been one of the main attractions. It could, however, be reconstructed on Footprint Lake.

The proposed dam below Wuskwatim Lake will raise the level of the lake from 760 to 810 feet, a rise of some 50 feet. The shoreline of this lake is mainly low bedrock and should flood extensively, especially to the south and southwest. The falls at Wuskwatim and Taskinigup will be destroyed or greatly reduced in height. It is also likely that a Cree dancing circle or religious ceremonial site located along the portage south of the lake will be flooded and destroyed. Some dyking may be necessary to preserve this site.

Traplines will be flooded, habitat that is essential for continued fur production destroyed and access to traplines may be hampered.

Manasan Falls is a possible Provincial Heritage Park and would have viewing points and a boat-in picnic area if developed in the manner outlined in the Conclusions.

The Burntwood River, below Manasan Falls has relatively low banks which will be overtopped by the extra flow. Below the Thompson bridge, the river will become a lake almost three times the present river width and velocities should, according to the Baracos-Galay report, be almost doubled. The proposed First Rapid's dam will cause the level of the river to rise to 610 feet; approximately 7 feet below the top of the Thompson bridge pilings, although with ice-jams this level could rise to 619 feet.

The extent of inundated land is limited by the relatively high 35 to 55 feet high banks. Ice conditions under high level discharges should be studied to determine possible flow controls in the Diversion so that a stable ice cover is developed, ice jams are minimized, water levels are not excessively high and the river can continue to be used for snowmobiling.

Increased flows plus the lake formed by the First Rapids dam, will also cause raised water levels on Mystery Lake. The high bedrock shoreline of this should not be greatly affected, although low-lying beach areas presently used for camping will be inundated.

Since the Burntwood River presently acts more like a lake than a river in terms of flow, the increased velocities with diversion should have little effect on its continued use for waterskiing.

Raised water levels at the first set of rapids below Thompson will probably submerge them negating their scenic value and the use of the area as a boat-in picnic site.

The increased flow in the Rat-Burntwood Rivers system will cause increased erosion of the clay banks, especially along the Burntwood River. The water quality in terms of potability should not be affected, but the sediment load will be greatly increased.

The normal sediment load of the Burntwood River is approximately 20 mg/litre, and the normal natural erosion rate at Thompson is 84,000 tons per year. For a diversion flow of 35,000 cfs., erosion will increase to 239,000 tons per year with an average sediment concentration of 150 mg/litre and a range up to 400 mg/litre.

All thirty-two archaeological sites will be affected by one or several destructive agents related to the diversion. One of the most productive sites, UNR 23, will be destroyed by activity around the Notigi Hydro camp or drowned under forty feet of water, UNR. 4, the productive, North West Company trading post on Threepoint Lake is on both low and high ground. This site will also be destroyed by flooding and erosion. All other high priority sites will be flooded or destroyed by the creation of a new shoreline.

The clearing that is necessary around reservoirs and impoundments for aesthetic, hydraulic and safety purposes can serve a double function if ecological studies are carried out before the clearing begins. These studies can identify wildlife habitat areas and areas that could form good wildlife areas. The clearing could then be geared toward improvement of marginal zones and providing new habitat for that lost through flooding.

This type of improvement is vitally important in areas of moose habitat. Areas suitable to maintain a stable moose population are even now quite limited, and the general density for most areas of northern Manitoba is 0.5 moose per square mile. If habitat creation and improvement could be carried out which would even maintain this density, a great step would have been taken to preserve a fast dwindling resource.

The same procedure could also be carried out for waterfowl. Areas of willow-alder which will be inundated and become unusable could be cleared of the tree cover to allow sedges and other marsh grasses to grow which will provide food, shelter, and nesting areas for the indigenous waterfowl and may attract greater numbers to use the area for nesting.

Dyking could also be used to preserve habitat and limit flooding where it is not absolutely necessary.

If these management areas are successful, later economic returns may accrue to the region from sport hunting used as a management tool to maintain optimum healthy populations.

In order to illustrate the relative importance of the diversion route to the region, the number of square miles of water area within zones parallel to Provincial Road 391 was measured. Provincial Road 391, as the principal access route to the region was taken as the central point for four zones parallel to each side of the highway. These zones were measured at 5, 10, 15 and 20 miles from the highway. The total number of square miles of usable water was measured within these zones and then related to the total water area affected by the diversion. This measurement was then expressed as a per cent of the total water area within the zones. This was considered as water area lost to intensive recreation use due to flooded standing timber, floating and submerged debris and general aesthetic degradation.

Within the zones shown on Map 5, there is a total of 850 square miles of usable water area. This is broken down to 122 square miles within 5 miles on either side of the highway; 316.5 square miles within 10 miles;

554.1 square miles within 15 miles; and 850 square miles within 20 miles. Of this, some 255 square miles or 30 per cent will be affected by the diversion of the Churchill River through the Rat-Burntwood Rivers system.

6.10 Outdoor Recreation Opportunities with Hydro Development

With the diversion of the Churchill River down the Rat-Burntwood Rivers system, the entire canoe route will be negated. Rapids will be submerged, falls reduced to nothing and the thousands of acres of uncleared flooded shoreline will destroy the aesthetic appeal of the route. Dead standing timber, submerged deadheads, floating debris and the inundation of beaches and rock outcrops which provided camping sites, will make shoreline access very difficult.

The raising of the level of Rat Lake by some 40 feet will negate its use for a commercial lodge site and destroy its wilderness potential.

A wayside development at the Suwannee River crossing at P.R. 391 will still make Rat Lake accessible by canoe and Rat Lake could still be put to extensive use for sport fishing as the northern pike production could increase by as much as 100%.

The road crossing at the Notigi dam site will become a stopping point for people travelling the highway. The control structure, the power dam and the reservoir will become a tourist attraction requiring the provision of facilities. It is anticipated that a one or two day camping experience plus a boat launch would have to be provided to serve transient visitors as well as providing access to Wapisu Lake. A picnic site and boat launch will also be necessary to provide access to the forebay reservoir area and a viewpoint picnic area will be needed near the main dam for interpretative purposes and fishing in the spillway.

A commercial site for a gas station/restaurant will also be necessary. It is also highly probable that requests will be made for cottage lots on the reservoir.

Due to the nature of the area and the continuing construction, only limited areas are available where these facilities can be provided.

The wayside/campground should be a transient type of facility rather than a destination type. This could be provided on a site some two and one half miles east of the dam in an area between the present road and the water. This site would be bounded on two sides by water, the river in front, and a bay on the east. A boat launch could be provided on the bay to provide access to Wapisu Lake.

However, the extra flow may cause the level of Wapisu Lake to rise to a point which will negate most of its scenic wilderness potential and flood beach and outcrop areas suitable for camping.

The campground could be designed to provide twenty-five to thirty sites initially, with room for expansion as demand grows. Facilities needed would be campground spurs, barbeque pits, tables, boat launch ramp, dock, sanitary facilities and water.

This facility could be established and operated by the Manitoba Parks Branch or by a commercial operator who would also operate a gas station/restaurant, rental cabin service.

Near the main dam, powerhouse and spillway, a viewpoint picnic area could be provided. This should consist of an elevated platform high enough to provide a good view of the project with explanatory diagrams and possibly a taped presentation describing the project. A small

picnic area of five to ten sites should also be provided. Access to the spillway will also be necessary for fishing.

Facilities needed would be the tower and interpretative material, picnic tables, firepits, sanitary facilities, fish cleaning pits and water.

It is highly probable that the forebay and reservoir will become a good sport fishing area. For this reason, a boat launch facility and a picnic area should be provided. This could be established in an area near the end of the present road, which will be flooded by the project. Facilities needed would be about ten picnic sites, fire pits, sanitary facilities, fish cleaning stations and a boat launch.

It is also likely that there will be a demand for cottage lots on the reservoir. This could be provided by the commercial operator in the form of a motel or rental cabin units. The matter must be examined in the much broader context of Parks Branch policy regarding cottaging and of management and control of another cottage area focused primarily on Thompson.

The rise in water levels on both Threepoint and Footprint Lakes will negate many of the attractions for both a commercial lodge operation and a living history museum at Nelson House. The motor launch tour would be done away with as most of the attractions would now be under water and dead standing timber around the shorelines is not an aesthetically pleasing sight. The museum and handicraft factory are still possible but it is doubtful if they would provide a large enough attraction to draw people in from the road.

The crossing of the Footprint River by P.R. 391 provides another location for the establishment of a wayside and boat launch facility.

From this crossing, via the Footprint River, Footprint Lake and Three-point Lake are accessible by boat. If one does not want to see flooded timber, Sawbill¹ Lake, Little Footprint Lake and Leftrook Lake are accessible to the north.

If the Manasan Falls dam is constructed as proposed, it will destroy a significant scenic area and the recreation potential associated with the site. Even the extra flow in the Burntwood River could negate its use for waterskiing if velocities double those presently in effect are produced. Winter use of the ice surface could also be affected if the extra flows produce unstable icing conditions.

Raised water levels due to the increased flow and backup resulting from the First Rapids dam will inundate beaches on Mystery Lake, presently used by campers and fishermen. The high rock shore should not be affected to any great extent and the lake should still be suitable for fishing and some camping.

The higher water levels however will negate the prime recreational use of the area around the first rapids below Thompson as a boat-in picnic site.

¹Local name used by residents of Nelson House.

7. CONCLUSIONS

Recreation Potential of Footprint Lake

- 7.1 In their natural state, the Rat-Burntwood River system and the intervening lakes are an excellent area for wilderness canoeing, camping, fishing, nature study and photography. Most of this wilderness potential will be lost due to flooding.
- 7.2 Sportfishing potential especially for northern pike could increase by as much as 100 per cent.
- 7.3 The Rat River crossing area and the Notigi reservoir will become an important tourist attraction. This is an excellent site for the establishment of a commercial site and a campground.
- 7.4 All presently identified archaeological sites along the diversion route will be destroyed by raised water levels.
- 7.5 Provincial Road 391 from Thompson to Lynn Lake will provide significant visitor inflow to the region.
- 7.6 Rat Lake and Wapisi Lake are both suited to use for commercial lodge operations due to their configuration, backshore condition, magnificent scenery and excellent fishing.
- 7.7 Shoreline accessibility will be impaired along the diversion route by flooded standing timber, submerged deadheads and floating debris resulting in a decrease in recreation potential.
- 7.8 Destruction of habitat areas for moose and waterfowl will reduce the production of these wildlife species, thus reducing their numbers for sport hunting and viewing.
- 7.9 The natural, aesthetically pleasing, setting of Footprint Lake will be greatly reduced or totally destroyed with water level increases of more than five feet over levels of July 25, 1972. The increased

water level will result in dead vegetation around the water's edge and bank slumpage which will take as long as 30 years to stabilize, depending on the height of rise. Such aesthetic degradation would cause a marked reduction in the quality of life for the Nelson House residents.

7.10 The present rock shelves around the settlement and a sand beach opposite the settlement now provide much of the summer recreation base for children and other residents at Nelson House. A rise in water levels would cover the rock shelf and beach, leaving an undesirable mud flat and a void in the present life style.

7.11 Aesthetic degradation would remove the present potential which the Footprint Lake area holds for the establishment of a locally initiated, owned and operated tourist development such as a living history museum. Such a venture, if properly planned with respect to social conditions, could result in not only a local industry, but also be a deciding factor in preserving the cultural history and serve to reinforce the personal pride of the Nelson House Cree and Metis.

7.12 Increased water levels would deteriorate the aesthetic quality of one of the best wayside locations along the Thompson to Lynn Lake highway at the Footprint River. Associated with this wayside are opportunities for hiking trails to a viewpoint, fishing trails to rapids above and below the wayside and a terminus for novice and family type canoe tripping.

Recreation Potential of Manasau Falls

7.13 Some of the highest recreation potential on the Burntwood River

is found at Manasan Falls, five miles upstream from Thompson. This is an area which should have been designated and protected under the Provincial Parks Act as a Heritage Park. Unfortunately, some damage has been done to the site by exploration work in the form of clearing of vegetation which has left debris, destroyed the naturalness of the site and created some erosion problems. These damages can be corrected, however, with minimal difficulty.

The high recreation capability of the site can be attributed to some of the following conditions:

- a. The Manasan Falls exhibit scenic grandeur of provincial significance. On an average July day about 6,800 cubic feet of water drops 24 feet vertically over a 400 foot width. Several protuberant rock outcrops divide the flow and create additional turbulent beauty.
- b. The shoreline configuration below the Falls is exceptionally suited to provide viewing from many angles, over an extensive area. Since the river makes a hairpin turn at this point, 2,300 feet of both shorelines face the falls directly. About an equal amount extend from the falls at oblique angles. This means that nearly one mile of shoreline from which the falls can be viewed exist in a rectangle, no more than 1,500 feet downstream from the falls.
- c. The proximity of Manasan Falls to a major population centre and transportation terminus like Thompson, immediately emphasizes the value of these falls in terms of who will be able to actually enjoy the falls by seeing them.

Currently, Thompson residents can visit the falls by boat, and many do. Although there is a road to the pumping station, use is strictly limited by the owners, International Nickel Company. The road presently passes through the Birch Tree Mine enclosure, but negotiations to solicit re-routing and parking areas could provide vehicular access, if desired.

- d. Thompson residents presently use the rock control point below the Burntwood Bridge as a recreation site for viewing and fishing. This will be lost with the proposed diversion. Similar rock control points are rare along this by-and-large clay banked river. Manasan Falls could provide a nearly as accessible and scenically superior alternative.
- e. The opportunity base for Thompson visitors is quite limited. There are mine tours, shopping centres, a float plane base, pubs, and a small zoo which would occupy two days at the most. Nickel Days provides one weekend of summer entertainment and a winter festival is also an annual event. Mystery Mountain ski resort, twelve miles north, is an excellent opportunity available to skiers. Despite these attractions, the alternatives available to Thompson visitors soon run out. Car travellers can take day trips to Paint Lake and Pisew Falls, but a visitor arriving by plane or bus is quite limited in mobility. There also seems to be an invisible barrier which bars the visitor, especially those with limited mobility, from truly experiencing the northern atmosphere of lakes, rivers and forests he knows exist, but cannot quite reach. He will get a brief glimpse of northern coniferous forest as he

travels the four miles from the airport to his motel room. If he walks to the edge of town he will definitely feel the forest which not only encloses this tiny bit of transplanted southern city, but also bars his entry into the northern atmosphere. The image of this has always been present in the mind, but how can he feel the spring of spruce needles under his feet; be cooled by the shade of northern forest over a pathway; touch the famous flowing rivers; breathe the invigorating forest air; or actually see and hear the roar of the rivers which are synonymous with northern Manitoba? This is a very real gap in the opportunity base which should not be available to only those who can be flown into a remote lake or spend a week on a wilderness canoe trip. A small glimpse of these experiences would be readily available to anyone if a provincial heritage park was established at Manasan Falls.

7.13.1 The Problem

One of the effects of Manitoba Hydro's Churchill River Diversion project as proposed will be to cancel this significant natural feature. This will occur in several stages:

- a. The average added flow from the Churchill River will double the long-term historic maximum July flow in the Burntwood River. The proposed average flow for July with diversion is 34,800 cubic feet per second, approximately five times the average historic July flow at 6,800 cubic

feet per second: Manasan Falls is more attractive at lower than average flows, largely due to the fact that more bed-rock is then exposed. Under diversion flow conditions the opposite will be the case. Also, with increased water and velocity, the falls could be altered so much as to resemble a sluice gate in any hydraulic channel.

- b. Increased flows will also increase water levels on the Burntwood River below Manasan Falls from the present July average of 604.5 feet to 618 feet at 35,000 c.f.s. With a control dam as proposed at First Rapids, water level will be increased to 619 feet. Presently, the crest of the Manasan Falls is at 628.5 feet. Thus the amount of vertical fall will be reduced from 24 feet to 9.5 feet at maximum discharge. Reducing the magnitude of the drop would reduce the grandeur of the falls.
- c. A higher water level, thus widening between the banks, and erosion can be expected on both banks at the top of the falls. The unsightly slumpage of clay banks and the loss of natural vegetation which now is an integral part of the beauty of the falls will result.
- d. The complete loss of these falls will occur when a control dam and generating station are built directly over the falls. This is not scheduled to happen before 1980.

7.13.2 Alternative Proposal

The following alternative is proposed as a method whereby Manasan Falls and the associated recreational benefits can be preserved without detracting from the hydro electrical benefits of the project:

- a. Construct the dam 2,500 feet upstream from Manasan Falls instead of directly over them.
- b. Construct a 2,000 foot power canal across the peninsula of land to rejoin the Burntwood River below Manasan Falls, thus diverting flows around the falls.
- c. Construct the power house at the downstream end of the power canal.
- d. Release moderate flow from the dam spillway to maintain a flow over the falls.
- e. Redesign flow discharge sequences so that the June, July and August flows are minimal. This would reduce levels in the Burntwood River below the falls. Normally, water released from the power canal would back up to the base of the falls, reducing the magnitude of the falls. The ultimate modifications to the existing diversion and power generation plan would be to construct another dam across the river at the power house; and then to pump the 1,000 - 2,000 c.f.s. flow coming over the falls and down the Manasan River, up over the restraining dam. This would maintain natural levels in the immediate falls area by preventing diversion water from backing up to the foot of the falls. It would also preserve the Manasan River, itself, a desirable recreation area.¹

¹Briefly, Manasan River has merit as a very accessible short canoe trip river from Ospawagan Lake or a longer route down the Taylor River. More facilities of this nature are required for the high percentage of young single men and young married in the Thompson area. Commonly, mine workers have three or four days off between shifts. Relative to a southern situation, only a few alternative options for occupying this time exist. This river also provides a unique opportunity to observe wildlife such as beaver and moose. The fluctuating water levels have prevented encroachment of coniferous trees and promoted deciduous growth and an ideal beaver and moose habitat not often available for observation. Some protection should be given this area as well.

Reducing flows during these summer months would also alleviate a potentially hazardous situation which will exist in the Burntwood River, close to Thompson. Under maximum flows the current will be 2.5 times that at present. Some recreational use is made of this river at present but currents resulting from the diversion will make this of borderline safety. Accidents such as boats tipping could prove fatal with the hazardous undertow which will likely be created by the expected 2.5 to 3.0 feet per second flows. To achieve lower summer flows, water could be ponded at Notigi reservoir. The ponded water could then be released from October to June¹, increasing slightly the flows proposed for these months.

- f. Plan construction of the Manasan structure for the earliest possible date in order to minimize bank damage at the falls.
-

¹Such a flow sequence would also benefit recreational use immediately downstream from the Notigi structure on Wapisu Lake. This lake ranks next to Rat Lake as having the highest recreational potential of all lakes on the Rat-Burntwood system. Both would rank close to one of the better northern Manitoba lakes, Paint Lake, a Provincial Recreation Area.

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ANNEX 1

Requirements and Capital Expenditure for a Tourist Lodge.

Footage Requirements

Main Building

25 guest rooms @ 280 sq. ft.	7,000
Corridor allowances	1,120
75-seat dining room	1,145
30-seat cocktail lounge	450
Social rooms	675
Kitchens	1,140
Reception, lobby and sundries	1,250
Storage, washrooms, staff rooms and offices	1,000
Pool deck and children's wading pool	5,200
Total	19,000 sq. ft.

Cottages

6 convertible complexes @ 896 sq. ft.	5,376
Total	5,376 sq. ft.
Service building, trailer lots	448
Fishermen's dock building	600
Gas and oil shed	100
	1,148 sq. ft.

Investment

Construction: Buildings

Main Building

19,000 sq. ft. @ 18.00 sq. ft.	342,000
--------------------------------	---------

Cottages

5,376 sq. ft. @ 14.00 sq. ft.	75,264
-------------------------------	--------

Trailer Lots

448 sq. ft. service building @ 10.00 sq. ft.	4,480
--	-------

Pool deck

40 chaise lounges and 20 tables @ 40	1,600
Sun lamps	600
Indoor/outdoor carpet one end 117 sq. yd @ 8.00	936

Sub total	\$ 3,136
-----------	----------

60 x 40 Swimming Pool	50,000
-----------------------	--------

Cottages

12 bedrooms @ \$1,200	14,400
6 large convertible lounges @ 1,200	7,200

Sub total	\$21,600
-----------	----------

Total furnishings and fixtures	\$184,476
--------------------------------	-----------

Outdoor construction

Access road	20,000
Parking 50 cars, 15,000 sq. ft. @ 25¢ per ft.	3,750
10 fully serviced trailer lots @ \$2,000	20,000
Water system	8,000
Sewer system	6,000
Landscaping	8,000
Walkways	2,500
Docks	18,000

Sub total	\$86,250
-----------	----------

Add 10% contingency allowance	<u>8,625</u>
-------------------------------	--------------

Sub total	\$94,875
-----------	----------

Add 6% professional fees	<u>5,692</u>
--------------------------	--------------

Total outdoor	\$100,567
---------------	-----------

Waterfront

Fishermen's dock buildings	
700 sq. ft. @ 10.00 sq. ft.	7,000
Add 5% contingency allowance	21,437

Total	450,181
-------	---------

Architect's fees @ 6%	27,010
-----------------------	--------

Total	\$477,191
-------	-----------

Furnishings and Fixtures
Main Building

25 guest room @ 1500	37,500
----------------------	--------

Dining room

75 chairs @ \$50	3,750
16 tables @ \$35	560
128 yds. carpet @ \$18	2,750
Draperies and decoration	5,000

	\$49,560
--	----------

30 Seat Cocktail Lounge

30 chairs @ \$50	1,500
8 tables @ \$35	280
50 sq. yds carpet	900
Drapes and decorating	1,500
Bar unit	3,500

Sub total	\$7,680
-----------	---------

Public rooms	7,500
Kitchen equipment	20,000
Tableware and linen	15,000
Office and staff areas	10,000

Sub total	\$52,500
-----------	----------

Outdoor Equipment

2 $\frac{1}{2}$ ton trucks	6,500
1 bombardier	10,000
4 power toboggans	3,600
30 boats, motors, safety and shore lunch equipment	45,000
6 canoes	750
1 excursion launch	4,000

Sub total \$69,850

Add 10% contingency allowance 6,985

Total Outdoor equipment \$76,835

Pre-Opening expenses \$30,000

Capital Investment Summary

Construction: buildings	477,191
Construction: outdoors	100,567
Furniture and fixtures	184,476
Outdoor equipment	76,835
Pre-opening expenses	30,000

\$869,069

Handicraft factory \$100,000

\$969,069

Museum and fort \$260,000

\$1,229,069

Projected Gross Return

106 vehicles/day vacation traffic

144 vehicles/day local northern

96 day season

$106 \times 96 \times 3.5 = 35,616$ visitors

$144 \times 96 \times 3.5 = 48,384$ northerners

Assume 15% of local traffic = 7,258

Assume 50% of vacation traffic 17,858

TOTAL 25,116

Assume 10% stay at motels = 2,511

Average stay 3 days = 7,533 visitor days

Average expenditure \$10/day \$75,330 visitor days \$75,330.00

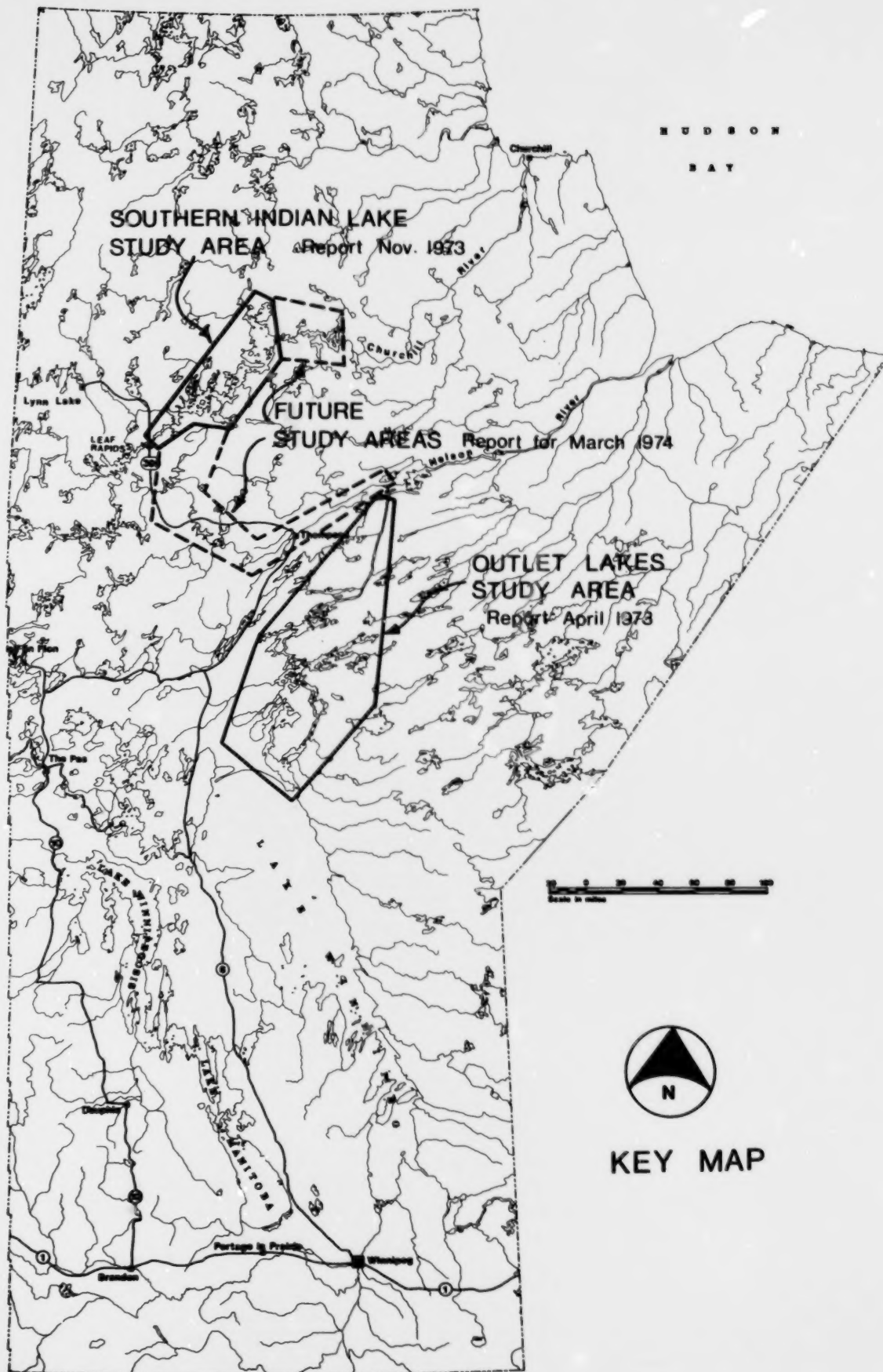
Total would take tour @ \$3.00/person = \$75,348 \$75,348.00

20% would buy souvenirs \$100,460 \$100,460.00

average outlay \$20/person

Revenue before payments on loan, etc. \$251,138.00

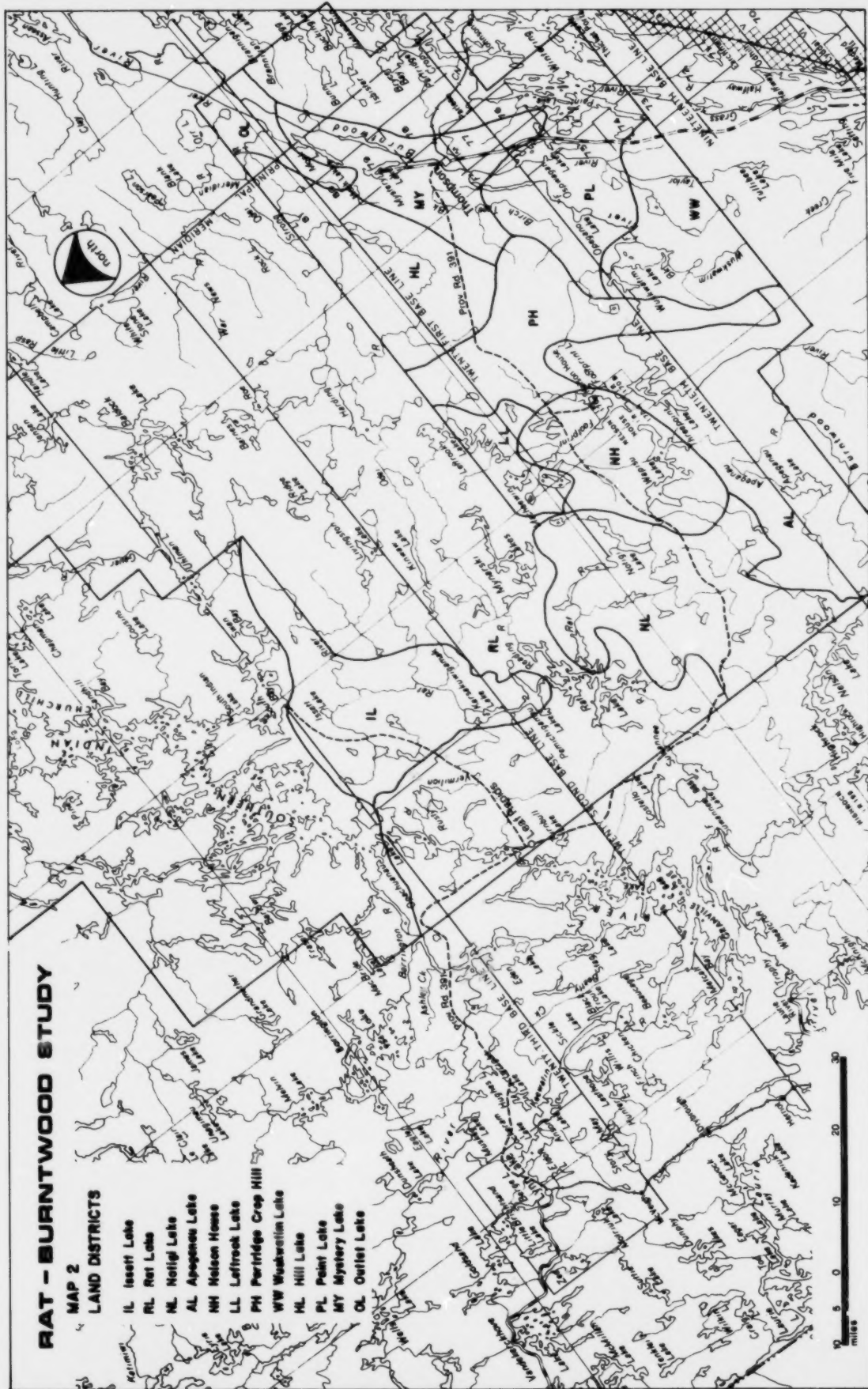
Assuming \$10,000 expenditures creates one job \$251,138.00 = 25 jobs.



RAT - BURNTWOOD STUDY

MAP 2 LAND DISTRICTS

- IL Issett Lake
- RL Rer Lake
- ML Notigi Lake
- AL Apogee Lake
- NH Nelson House
- LL Ledfrock Lake
- PH Perridge Crop Hill
- WW Wadwellin Lake
- HL Hill Lake
- PL Point Lake
- MY Mystery Lake
- OL Outlet Lake



RAT - BURNTWOOD STUDY

MAP 3

RECREATION POTENTIAL NATURAL STATE

Commercial Site

Commercial Lodge

Wayside

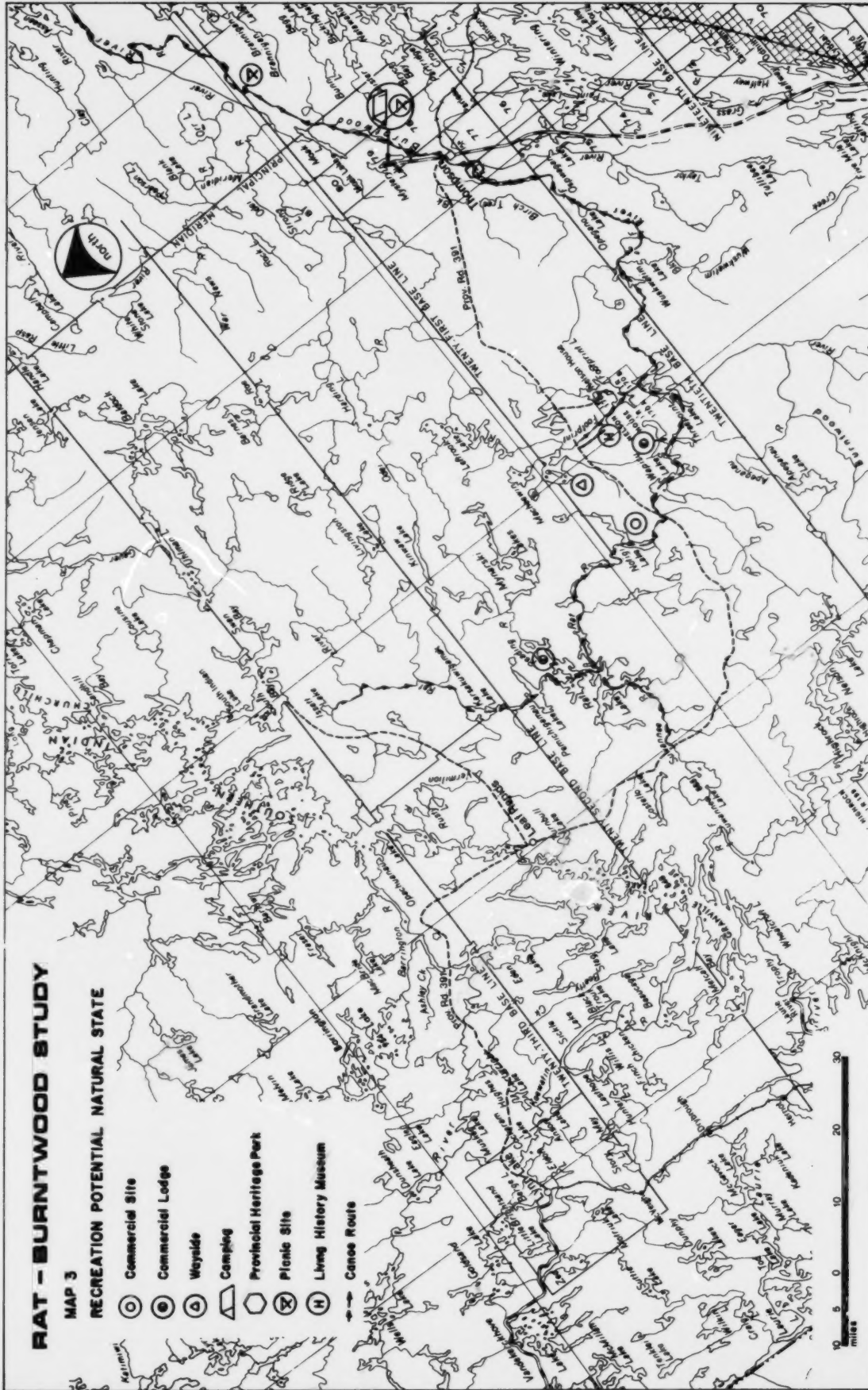
Camping

Provincial Heritage Park

Plenic Site

Living History Museum

Canoe Route

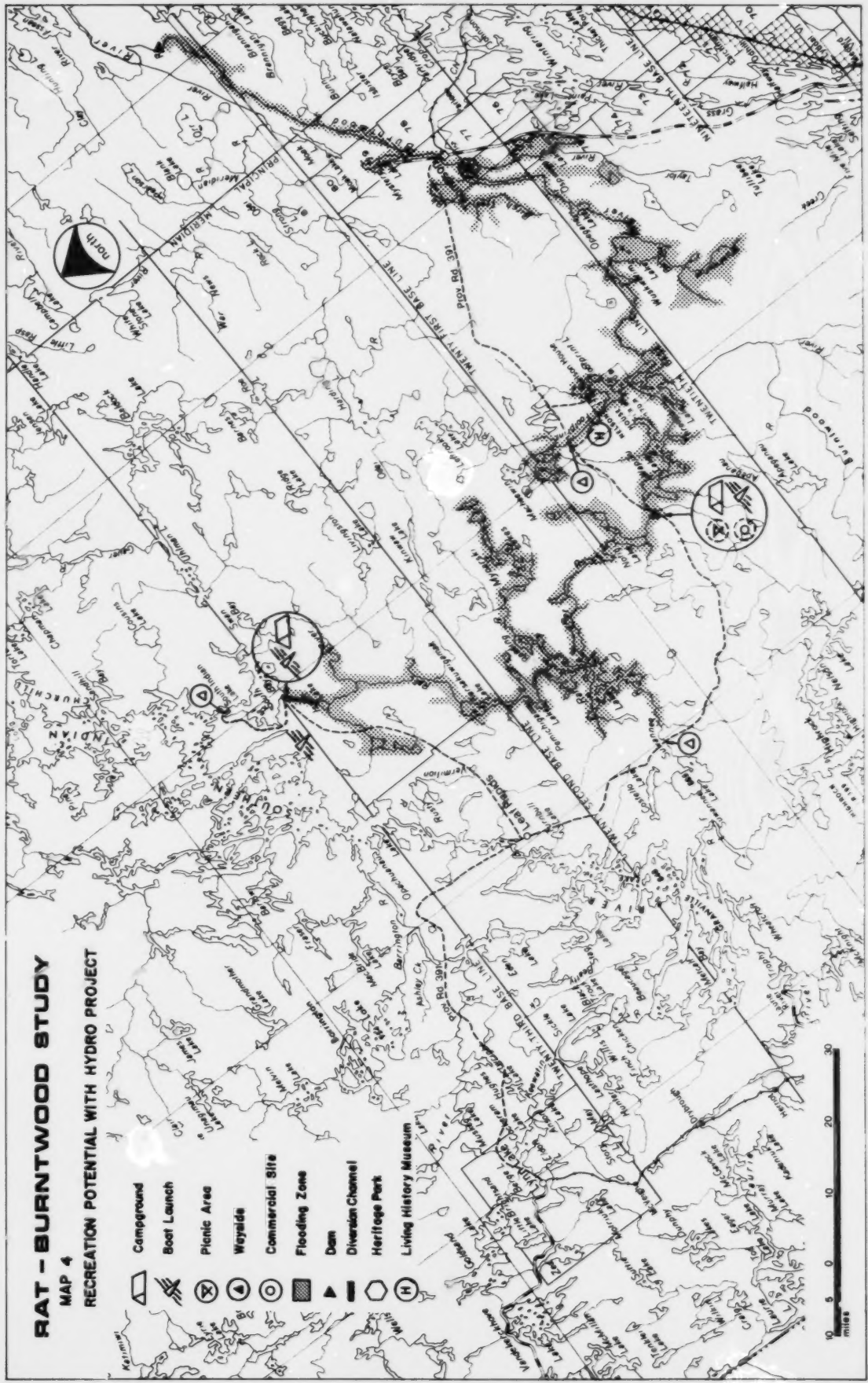


RAT - BURNTWOOD STUDY

MAP 4

RECREATION POTENTIAL WITH HYDRO PROJECT

-  Campground
-  Boat Launch
-  Picnic Area
-  Wayside
-  Commercial Site
-  Flooded Zone
-  Dam
-  Diversion Channel
-  Heritage Park
-  Living History Museum

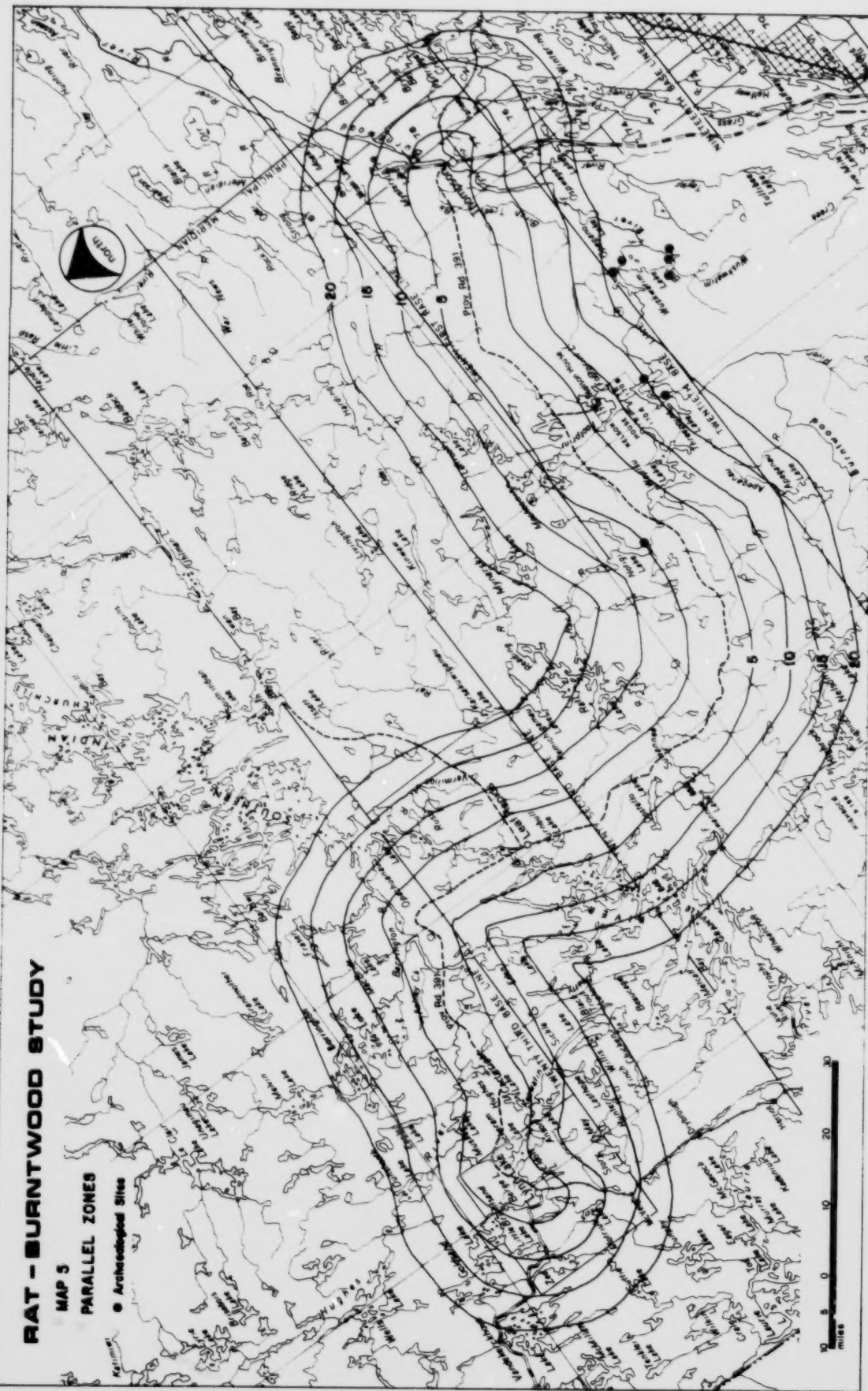


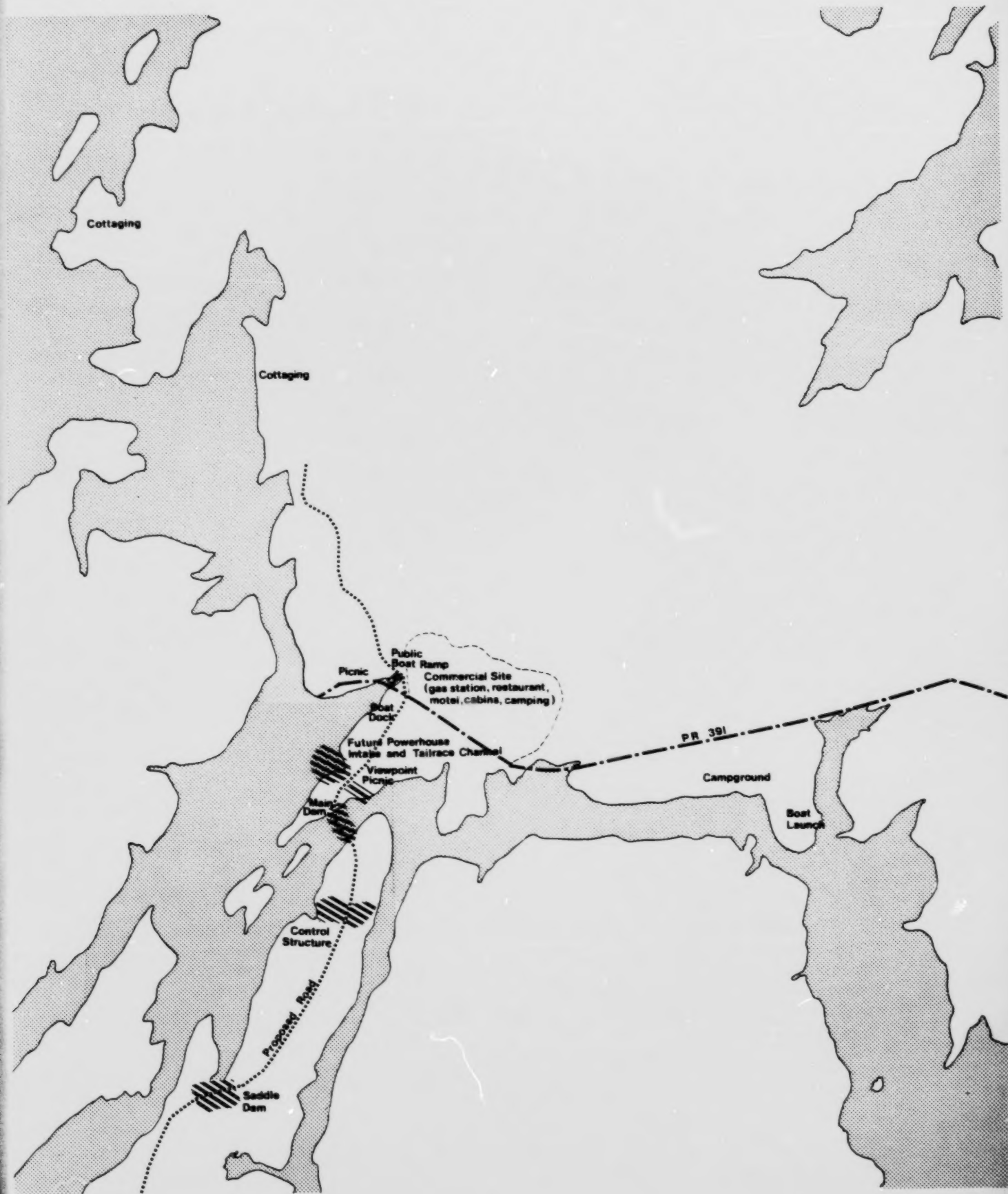
RAT - BURNTWOOD STUDY

MAP 5

PARALLEL ZONES

● Archaeological Sites





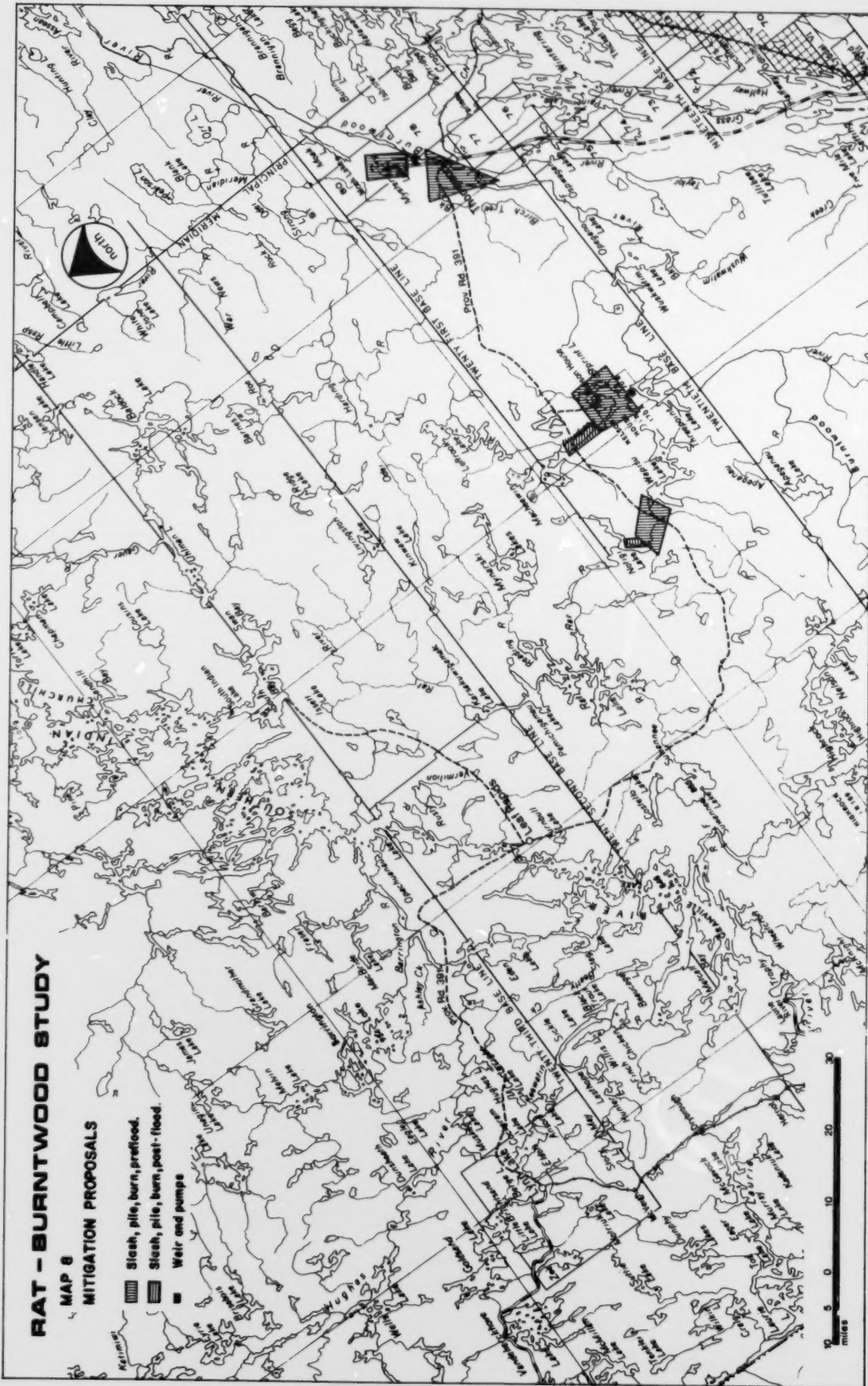


MAP 7 Scale 1 = 12,000
ALTERNATIVE MANASAN PROPOSAL

RAT - BURNTWOOD STUDY

MAP 8
MITIGATION PROPOSALS

-  Slash, pile, burn, pre-flood.
-  Slash, pile, burn, post-flood.
-  Weir and pumps



0 5 10 20 30
miles

APPENDIX 7 - D
RECREATION ASSESSMENT -
SOUTHERN INDIAN LAKE

RECREATION ASSESSMENT
SOUTHERN INDIAN LAKE

by

D. MOFFATT, W. SCHICK and J. LAMB
Parks Branch
Manitoba Department of Tourism, Recreation and Cultural Affairs
Winnipeg, Manitoba
November, 1973

for

THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD

SPECIAL NOTE

THE CONCLUSIONS AND RECOMMENDATIONS CONTAINED IN THIS APPENDIX ARE THOSE OF THE AUTHOR(S) AND ARE NOT NECESSARILY THE SAME AS THE CONCLUSIONS AND RECOMMENDATIONS OF THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD AS EXPRESSED IN THE SUMMARY REPORT AND THE TECHNICAL REPORT.

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1. RECOMMENDATIONS

Archaeological Sites

- 1.1 Adequate funding should be provided to allow complete excavation prior to flooding of Kame Hills sites which are below floodline.
- 1.2 Adequate funding should be provided to excavate other sites below floodline on the Churchill system which are necessary to interpret the pre-history of Manitoba, sites to be prioritized by Churchill Diversion Archaeological Project.
- 1.3 An archaeologist should accompany clearing crews in the Leaf Rapids and Churchill areas.

Pre-flood Clearing

- 1.4 The inlet of the Churchill River adjacent to the Leaf Rapids area and indicated as priority I on the accompanying recommendations map should be cleared and grubbed to flood level plus two feet.
- 1.5 Areas indicated on the accompanying recommendations map as priority II, III and IV should definitely have vegetation below floodline cleared, piled and burned prior to flooding with the remainder of areas being cleared in order of priorities indicated.
- 1.6 In order to maintain access and avoid reduction of aesthetics, the shoreline vegetation of all rivers and streams entering the Churchill River between Leaf Rapids and Opachuanau Lake, Barrington River between the rapids and Opachuanau Lake; Opachuanau Lake and Southern Indian Lake should be cleared, piled and burned from 100 yards downstream of existing rapids to a point where the 2 foot plus new high water level contour intersects the rivers.

1.7 If clearing of all river mouths is not feasible prior to flooding, priorities indicated on the accompanying recommendation map should be followed, but with priority I sites definitely cleared before flooding.

Safety Measures

1.8 Landing areas should be established at intervals of three miles as approximately indicated on the accompanying recommendation map. Approach widths should be at least 200 feet wide and marked with appropriate devices to be clearly visible from the lake. Vegetation should be cleared, piled and burned.

1.9 The commercial fishermen and residents of South Indian Lake should be consulted as to the siting of the landing spots.

1.10 All shoals and rocks in the transportation channel which will pose a hazard after flooding should be marked by buoys so as to be visible from small pleasure craft as well as larger fish boats.

Mitigation following Flooding

1.11 An inspection and clean-up program should be instituted following flooding to insure that all areas cleared are kept free of debris.

1.12 A program should be initiated to collect and boom floating debris following flooding.

1.13 Booms should be located across bays of Southern Indian Lake which do not have significant sport fishing potential and where the backshore is of low relief and flood damage already quite extensive.

1.14 A study should be carried out in three to five years following flooding to determine the overall effects of flooding, the effectiveness of mitigation practices and to recommend additional mitigation practices.

1.15 Funds should be provided to clear additional areas as might be recommended by post-flood studies or other requests.

Parks and Outdoor Recreation Facilities

1.16 A park master plan should be developed for the inlet and peninsula on the Churchill River at Leaf Rapids with the view to establishing a local park.

1.17 Development of recreational facilities in the study area should proceed according to the post-flooding recreation master plan outlined herein.

Towards an Enlightened Use of Manitoba's Northern Resources

1.18 All future projects of this nature involving Manitoba's landscape should be examined with the object of multipurpose use.

1.19 Future projects should begin well before design and allocations are irreversible by conducting a bio-physical inventory and shoreline classification. Once an adequate inventory of resources is available and ecological relationships defined, impact statements should be prepared which would evaluate the primary project being proposed.

1.20 A provincial inventory of resources should be completed, to be followed by major decisions as to criteria for designation and use, and by a comprehensive land use plan. This would serve as a tool to evaluate the relative merit of future project proposals.

2. TERMS OF REFERENCE

The area dealt with in this report consists of the shoreline and associated backshore of the Churchill River from Leaf Rapids to Opachuanau Lake, Opachuanau Lake, the Barrington River to the rapids, the McBride River to the rapids, and Southern Indian Lake.

The Parks Branch was required to assess the impact of water regime changes on identified recreation sites; to make recommendations to mitigate losses and enhance benefits to recreation derived from the hydro-electric developments; and to consider the feasibility of establishing such additional recreation opportunities as may be facilitated by the proposed developments.

The Manitoba Hydro proposal consists of a plan to dam the outflow of the Churchill River from Southern Indian Lake at Missi Falls and to divert this flow via a diversion channel from South Bay at the southern end of the lake down the Rat and Burntwood Rivers and finally into the Nelson River via Split Lake. Hydro-electric dams will be constructed on the Rat River below Notigi Lake, at Wuskwatim Falls and at First Rapids upstream from Split Lake. The diversion will put 30,000 cfs. of water down the Rat and Burntwood Rivers increasing their flow 8 times and 6 times respectively.

3. OBJECTIVES

The entire area covered under the present study had never been thoroughly studied in terms of recreation potential. Before any assessment could be made with regard to the impact of water regime changes on recreation, a survey of the area to identify recreation sites had to be done.

The first objective of the study was to conduct an inventory of potential outdoor recreation sites in the area. Following this, the second objective was to determine what effects Hydro's proposals would have on each site. Once it was understood how each identified recreation site and on a broader scale, how the entire recreation region would be affected by the hydro-electric developments, the third objective could be applied. This objective was to make proposals which, if effected, would minimize damage and enhance the benefits to recreation within the region to be affected by the Manitoba Hydro projects. The final objective of this study was to assist, along with the studies of other disciplines, in the formulation of a more informed and co-ordinated use of Manitoba's valuable northern resources.

4. STUDY AREA

The area to be examined was the Churchill River from Leaf Rapids to Opachuanau Lake, Opachuanau Lake, the Barrington River to the rapids, the McBride River to the rapids, and Southern Indian Lake. This area was studied with the above objectives in view, the results of the study making up this report. A similar study will be done on the Rat and Burntwood Rivers and the intervening lakes along the diversion route.

5. METHODOLOGY

5.1 The Rationale

"Outdoor recreation" is a nebulous, amorphous expression. It can cover a very wide range of activities and still not be clearly understood by the average person. The Webster's dictionary defines recreation as a pleasurable occupation of leisure time, or a means of refreshment or diversion. It is from this viewpoint that one must look at Southern Indian Lake and environs.

A survey of outdoor recreation capability does not simply mean the cataloguing of all the beaches on a lake and the siting of campgrounds or parks using one or more small areas bounded by a perimeter which has little bearing on anything but a legal description. Designation of an area as a park does not necessarily mean that it has recreational significance and non-designation does not imply that an area has no recreational significance. It is, in many cases, a matter of degree. An area of special ecological interest may be designated to preserve and protect it by curtailing or severely limiting access and use. An area that is being heavily used may be made into a campground to control use. However, designation may also result in overuse by making an area known and more attractive to use.

Areas like Southern Indian Lake which may never come under a strict legal designation are not lacking in recreation capability, but are too far removed from normal travel patterns to receive intensive use.

This does not mean that they will not be used for extensive

recreation such as commercial resorts for hunting and fishing, possible wilderness camping use, fishing excursions from Leaf Rapids or weekend fishing and sightseeing trips from Leaf Rapids.

Various opinions exist regarding what form an "Impact to Recreation" statement should take and just what information it should comprise. One common expectation is that a statement will be made on how existing or proposed parks will be affected by higher water levels. Another opinion is that the analysis will be a Canada Land Inventory type of shore-analysis. Still another view is that such a report should list the total dollar value loss or gain to the tourist industry. This report, by examining the total resource base and various policies applicable, considered the outdoor recreation picture of Southern Indian Lake in terms of each of these expectations. Then, considering these discussions, area constraints, and the demand projections, a total recreation master plan for the study area was developed. A similar examination of the projected resource base for post-flooding conditions led to the development of another outdoor recreation master plan. By comparing pre- and post-flooding plans, gains and losses to outdoor recreation were identified. Following this, consideration was given to methods whereby benefits could be enhanced and losses ameliorated.

5.2 The Process

The preliminary in-office study involved the analysis of forest inventory maps to identify major areas of desirable vegetation cover, a review of the literature pertaining to the study and an examination of air photos and aerial mosaics. This preliminary study provided the background data and regional overview necessary for the summer's field work.

Field work was carried out by dividing the study area into regional components based on access. Each regional segment of the study area was inventoried as a unit by aerial reconnaissance and ground survey. Areas having desirable foreshore characteristics, shoreline characteristics, backshore composition, scenic qualities and water body characteristics, were noted. Pertinent information was recorded on topographic maps, tapes, air photo mosaics and by colour slides.

Specific resource information was requested from other disciplines.

Utilizing this information plus Parks Branch site evaluation data such as foreshore characteristics, shoreline characteristics, backshore composition, aesthetic characteristics and water body characteristics, macro areas having recreation potential were defined.

The suitability of an area for recreation, the type of recreation it is suited for, and the intensity of use it is capable of varies according to a combination of attributes and the quality of each attribute.

The prime recreation orientation will be directed to water use for powerboating and fishing. It is important that these activities can

be carried out with a minimum of danger or hazard. Therefore, water bodies were judged on the availability of sheltered coves, bays and channels, the absence of large areas of open water and the absence of a large number of shoals, submerged rocks and extensive weed growth.

An important consideration was the shoreline accessibility so that areas having sand beaches or approachable rock shorelines were preferred to areas with rubble shoreline or extensive mud flat and weed growth.

The quality of the backshore affects the type and the intensity of use to which an area is suited. For intensive use and backshore development, a varied timber cover, adequate soil depth, and adequate drainage is required.

By using the existing forest inventory data and a system of classification based on species composition, forest stands within each area were classified according to recreational potential.

A forest stand is considered prime for recreation development if it is diverse in its species composition; has a prevalence of species which indicate desirable qualities such as good drainage and high tolerance to use; and if it is not overmature. For example, a pure stand of black spruce is usually undesirable since it is most often indicative of poor drainage, and has proven from past experience to be unsuitable for development because of its susceptibility to windfall. Information is also available on stand density and Crown closure conditions. Thus, prime recreation land on a micro scale can be pinpointed in the midst of a larger or macro site of many square miles.

Potential for sport fishing is an important concern for recreation

in northern Manitoba. According to the Norman Tourist Study, 69 per cent of all visitors to northern Manitoba engage in sport fishing. It may be speculated that this is one of the main reasons for visitors venturing north of the 52nd parallel.

Scenery and aesthetic quality are important weighting factors when considering the recreational potential of an area. These are important for several reasons. It is assumed that persons seeking outdoor recreation prefer a scenic area. Thus, areas of changing landscape relief; with irregular shoreline configuration; and with a diversity of backshore vegetation are considered to have more recreation potential than areas of continuous low relief; with very few shoreline indentations or changes in course; and with unvaried timber cover. At the same time, it was assumed that any reduction in the aesthetic quality of an area decreased the recreation potential. Thus, areas of lower recreation potential will include extensively burned areas, flooded areas with standing or floating dead timber, and areas scarred by mechanical earth movers or tree clearing equipment. From another viewpoint, just as attempts are made to preserve examples of unique or outstanding human history, ecosystems, or wildlife populations, so by identification and designation, an attempt should be made to preserve outstanding or unique scenic areas.

The presence of wildlife or waterfowl also enhances the recreation potential of an area. Wildlife based recreation can include consumptive forms such as hunting as well as non-consumptive uses such as photography and viewing.

Access to an area is an important regional constraint when considering its recreation potential. If it is impossible or prohibitively expensive to reach an area, its potential is severely limited. Therefore, areas easily accessible by car or by boat from population centres held more innate potential than those that were very remote. However, it is necessary to identify inaccessible areas displaying a high recreation potential and to preserve them for future use. New technology and transportation may open these areas in the future.

Thus, from the entire study area, macro areas having recreation potential could be identified. The next step was to analyse the impact of Manitoba Hydro's proposals on those areas having recreation potential. During the field season of the summer of 1973 micro sites were identified within the macro areas for field checks. This facilitated projection of the impact of Hydro's proposals, and of recommendations for amelioration of losses or enhancement of benefits.

This report was written within the guidelines and practicalities of existing Manitoba Parks Branch policy. Parks Branch policy for recreational development in northern Manitoba would appear to be that if access is available to an area, and use is being made of the area, limited facilities will be provided if warranted. No access roads would be developed, however, solely to provide for a recreational experience, unless an intense need was demonstrated, or pressure exerted. No intensive developments would be undertaken unless the designated area fills the requirement of providing a unique recreational experience.

The ultimate step in this study would have been an evaluation of the project within the perspective of a total provincial recreation master plan. This is non-existent at this time. Even policy guidelines are vague. The same situation would appear to exist for other resource based concerns. An absolute inventory of resources for the entire province followed by an overall land use plan is required. Only then can the impact of a project such as the Churchill River Diversion be fully evaluated.

6. OBSERVATIONS

6.1 Recreation Trends

This section discusses the relative importance of recreation in the lives of Manitobans; of tourism in the economy of Manitoba; and the need for water based recreation areas as a competitor for Manitoba's landscape.

6.1.1 Activity Patterns of Prairie Residents

The Canadian Outdoor Recreation Demand Study 1967-1969 revealed that for the average Prairie resident, the participation rate in outdoor recreation activities is generally higher than the national average, and that the growth rate of Prairie participation is the most active in the country. The trend to greater use of sports and recreation facilities, the increase in leisure time with shorter working weeks and more vacation travelling can be expected to continue.

The more popular forms of outdoor recreation are pleasure driving, picnicking and sightseeing, visits to historical sites and extra-urban parks. Swimming also has a high participation rate. Activities such as power boating, fishing, hunting and camping which require more specialized equipment also rank fairly high.

Nature study and bird watching are some of the low ranking pursuits. At the bottom of the scale are specialized vigorous activities such as climbing, skiing, waterskiing, skidooing and canoeing.

Over 64% of Prairie residents drove for pleasure and more than 50% enjoyed picnicking. The highest figure in Canada for the latter activity. Participation in swimming was only 42% and power boating only 12%, low

in comparison to the rest of the country.¹ It would appear that there exists an unfulfilled demand for these activities.

For the last ten years, user figures for most major park and recreational areas in the Prairies have shown a steady annual increase of 7 to 10%.

It is anticipated that between 1965 and 1980, participation will increase by 121% for waterskiing, 78% for camping, 78% for hiking and 72% for swimming. By the year 2000 it will have increased by 363% for waterskiing, 238% for camping, 218% for hiking, 215% for boating and 207% for swimming.² With these rates of increase, it is evident that recreation areas must be available to meet the demand.

6.1.2 Existing Recreation Nodes

Present recreational facilities and developments in Northern Manitoba have been geared to three major nodes: The Pas-Flin Flon, Thompson and Lynn Lake.

The Pas-Flin Flon node contains two Provincial Parks, Clearwater and Grass River, as well as fifteen campgrounds and waysides operated by the Province.

The Thompson area contains the Paint Lake Provincial Recreation Area providing camping, cottaging, swimming, fishing, boating and picnicking, as well as three wayside parks and the proposed Partridge Crop Provincial Park east of Thompson and a ski-hill at Mystery Mountain twelve miles north of the city.

1. Saskatchewan-Nelson Basin Board. Water supply for the Saskatchewan-Nelson Basin. Appendix 7, Environmental Considerations. Saskatchewan. 1972. p.316.

2. Ibid.

The Lynn Lake area has cottaging on Zed Lake, Berge Lake, Motriuk Lake and Francis Lake and the possibility of a Provincial Park in the Hughes, Eden, Stag Lakes area. There is also a ski hill development south of town.

The area between Thompson and Lynn Lake along the new section of P.R. 391 is devoid of recreational facilities and in view of the growing demand for outdoor recreation and the growth of settlements such as Leaf Rapids, some facility development is necessary.

Present recreational facilities in the Southern Indian Lake area are: one cabin owned by an American at the confluence of the McBride and Barrington Rivers; a ski hill under construction at Leaf Rapids; a small beach-picnic area developed near South Indian Lake; a baseball diamond and swimming area on Turnbull Lake; and a forty unit campground to be built on Granville Lake by Parks Branch, in 1974.

Occasionally the traditional canoe route up Southern Indian Lake to Moss Lake and across the watershed division into the Seal River system to the coast of Hudson Bay and Churchill is travelled by serious canoeists as well as the more sheltered route through the narrow bays to Big Sand Lake. Participants would average approximately two parties per year.

6.1.3 Northern Tourist Profile

The market for tourism in northern Manitoba consists of three distinct components:

- (1) the United States visitor
- (2) the other Canadian visitor
- (3) the Manitoba (non-northern) visitor.

Each of the market segments was considered separately and estimates of their activity profiles examined.

In 1970, there were 286,500 visitors to northern Manitoba. Of these, 29,800 were from the United States; these made up 10.4% of the total visitors to northern Manitoba but only 3.5% of the total United States visitors to Manitoba. There were 49,770 other Canadians who comprised 17.6% of the northern region tourist traffic, but only 2.9% of the total Canadian visitors to Manitoba. Manitobans not resident in the north accounted for 101,440 visitors or 34.1% of the northern traffic but only 5% of the total intraprovincial traffic. The remaining 37.9% or 105,490 visitors were resident in the north.

In Manitoba, the northern region attracts only between 3 - 8% of the United States visitor flow into the province. Approximately 70% of these visitors come from the west-north central region, with Minnesota and North Dakota constituting 50% of the market.

The people of the west-north central region have a high propensity to travel, averaging 980 miles one way on vacation, and have a high percentage ownership of recreational equipment pertinent to northern recreation.

United States visitors prefer motels and campgrounds and account for about 70% of all use. In the northern region this pattern is altered slightly to campgrounds and greater use of "lodge" facilities. United States campers tend to use more sophisticated self-contained equipment.

From 1967 to 1972, the number of United States visitors entering Manitoba increased from 1,036,179 to 1,446,960. Of the 1972 visitors,

3.8% visited northern Manitoba, almost double the 1970 rate.

The northern region also attracts between 3 and 8% of the Canadians who visit Manitoba. Of these Canadian visitors, people from Ontario make up 50% of the total visits. From 50 to 60% of the traffic to the north is from Saskatchewan.

The number of Canadians entering Manitoba has increased from 1,231,833 in 1967 to 1,765,359 in 1972. The Canadian visitor is interested in historical sites, museums and shopping. The pattern set by Canadian visitors is slightly different from that of Americans. Over 58% stay at the homes of friends or relatives when in the northern region and there is a very low use of campgrounds. Those campgrounds they do use tend to be urban oriented or located close to urban centres. Conversely, campgrounds heavily used by local people are avoided by the American visitor who prefers less urban oriented campgrounds. Table I shows the activity preferences of non-Manitoba visitors to northern Manitoba.

TABLE I
ACTIVITY PREFERENCES OF NON-MANITOBA TOURISTS
TO NORTHERN MANITOBA, 1969-71*

Activity	1969	1970	1971	Average
	%	%	%	%
Fishing	76.7	81.1	64.3	74.0
Swimming	9.2	21.4	11.5	14.0
Boating	19.7	31.7	14.5	22.0
Historical Sites	11.3	23.7	26.8	20.6
Canoeing	1.1	2.9	5.2	3.1
Waterskiing	3.6	4.4	2.2	3.2
Museums	7.4	17.0	18.9	14.4
Hunting	8.9	2.7	6.3	6.0
Shopping	N/A	22.6	17.21	19.9
Sporting Events	11.2	12.0	5.1	9.4
Musical Events	2.4	4.6	2.5	3.2

*Taken from the "Tourist Reception Centre Surveys", for 1969-71, conducted by Research and Statistics Branch.

The largest proportion of the tourist market for northern Manitoba is accounted for by visits by Manitobans not resident in the north. Table II shows the activities undertaken in northern Manitoba by Winnipeg and other Manitoba residents. The pattern is similar to the United States and other Canadian visitors in that fishing, boating, outdoor oriented activities rank high. Manitobans use campgrounds in the northern region to a greater extent than in the rest of the province, but they use less sophisticated equipment than do other visitors.

TABLE II
ACTIVITIES UNDERTAKEN BY WINNIPEG AND MANITOBA
RESIDENTS IN NORTHERN MANITOBA, 1970

Activity	1970	1970
	Winnipeggers ¹	Manitobans ²
	%	%
Swimming	16.2	67.0
Fishing	27.0	69.0
Boating	16.8	42.0
Canoeing	3.6	6.0
Waterskiing	2.4	3.0
Picnicking	15.0	67.0
Hunting	1.2	-
Shopping	-	61.0

¹ Taken from the "Winnipeg Household Survey of Vacation Travel".
 Research and Planning Branch, 1970.

² Taken from "Norman Tourist Study", by D. McCloy, 1970.

6.1.4 Projections to 1980

Projecting the present visitation rate (using linear trend line fitting) for United States visitors to Manitoba gives a total of 1,120,041 overnight visitations by 1980. With a 5 to 8% visitation rate to northern Manitoba, visits in 1980 are expected to average 56,002 to 89,603 visits and tourist expenditure for 1980 will be approximately \$6,000,000. The number of nights of accommodation needed will be 364,013 to 522,420 visitor nights.

The number of other Canadians entering Manitoba has increased, and projected to 1980 means a total of 785,271 overnight visitations. With a 5 to 8% visitation rate to northern Manitoba, visits to 1980 range from 39,264 to 62,822, with an expenditure of approximately \$3,000,000 and between 223,805 to 358,085 visitor nights of accommodation needed.

By 1980, visits by Manitobans to northern Manitoba will average 322,150 to 348,715 with an expected expenditure of \$18,000,000 and 1,675,180 to 1,818,518 nights of accommodation needed.

At the foregoing rates of increase, by 1980, the total for northern Manitoba will be between 417,416 and 502,140 visits with a total of 2,262,998 to 2,699,023 visitor nights and an expenditure of \$28,000,000.

At the present levels of supply, the following number of unit nights³ of accommodation are available, 132,498 unit nights camping, 62,883 unit nights seasonal commercial and 350,400 unit nights yearly commercial, for a total of 545,781 unit nights. The estimated need on a yearly basis by 1980 is between 480,464 and 568,480 unit nights.

Commercial accommodations in the north are at present operating on an average 65% occupancy rate. Non-vacation traffic and itinerant workers utilize large percentages of accommodations in certain areas, thus the actual available unit nights is estimated at 268,633. This gives a total of 401,131 unit nights available at present supply.⁴

³ Unit night - use one unit of accommodation for one night.

⁴ Research and Statistics Branch. Personal communication.

The above information indicates a need for an additional 171 to 325 campsites and 217 to 458 commercial units of accommodation, with a need for 270 to 517 units of commercial accommodation during the peak season.

The overall demand for outdoor recreation is growing at the rate of 10% per year. Demand for cottage lots is increasing and ownership of water oriented recreational equipment is increasing. In Leaf Rapids alone, a town of 3,000, there are already some 200 power-boats. As this town grows to its planned size of 15,000, per capita ownership of boats can be expected to increase proportionately.

The pressure for inexpensive fishing trips is also increasing. A good example of this is the Southern Indian Lake Co-op fish plant at Leaf Rapids. They are getting three to four requests per day for sightseeing and fishing trips aboard their collection and supply boats, which they cannot accommodate.

The completion of the Thompson-Lynn Lake road will increase this demand, for it should carry approximately 106 vehicles of vacation traffic per day. Over a ninety-six day season, this amounts to 10,176 vehicles or 35,616 people who will require accommodation and facilities either in campgrounds or commercial accommodations. The potential expenditure in the region from these vacationers is \$231,504.

It is the lack of any effective policy, adequate facilities, the shortness of the season, and high costs of access which place the most difficult constraints on recreation development in the northern region.

However, informed and enlightened planning at local and provincial levels should alleviate the shortage of facilities. The access problem

will be partly remedied by the completion of paving of P.T.H. #6, the upgrading and paving of P.R. 391 to Thompson, the completion of P.R. 391 between Thompson and Lynn Lake and the extension to Nelson House and ultimately to South Indian Lake. It remains for the legislators and administrators to develop a system of policy that will allow for enlightened multiple use development of Manitoba's northland for the benefit of all Manitobans.

6.2 RESOURCE ANALYSIS

6.2.1 Physiography, Soils and Vegetation

The study area is part of the Churchill River Basin, and falls within the physiographic region known as the Precambrian drift plain. This varies greatly in relief throughout its extent. It is subdued in the Nelson depression, but becomes increasingly rough to the south-east and northwest where it reaches a maximum elevation near the Saskatchewan border of 500 feet. In detail the surface is hilly with rock outcrop, eskers and drift ridges rising a few hundred feet above valley levels.

Southern Indian Lake is approximately eighty miles long and averages five miles across, the widest portions being about ten miles across. The main shoreline control of the south basin is bedrock with narrow bedrock shelves, boulder beaches and sheer rock faces forming the shoreline. North of the Sandhill Bay area, the shoreline is controlled by clay and sand, and wide sand beaches are the most common shoreline type.

The surface of the study area has been severely glaciated and is

covered with varying amounts and thicknesses of glacial drift with abundant rock outcrops and numerous eskers. Bogs and lakes cover 40 to 60% of the surface. The dominant soil types are grey wooded, brown podzolic, podzol and organic soils.

A suitable soil type is sought when considering possible intensive recreational development of backshore areas. Such developments might consist of structured campgrounds, cottaging and the connecting roads. Medium to well drained coarse textured mineral soils, as opposed to poorly drained organic soils, are preferred. Usually, backshore soil type is of importance only as it affects shoreline composition when considering extensive water and shoreline based forms of outdoor recreation as is the case in much of the study area. As well, when considering proposed reservoirs such as this, knowledge of backshore soil conditions is necessary when predicting the characteristics of the new shoreline. Coarse textured, sand beach forming soils and smooth bedrock of less than forty percent slope are conducive to shoreline accessibility and thus increase the recreation capability of a water body.

Mixed vegetation stands are preferred for intensive recreation development for several reasons: diversity adds to the scenic or aesthetic appeal of an area. Diversity also is a good indicator of ecological stability. Mixed vegetation tends to withstand slight modifications such as opening up an area whereas pure black spruce stands once opened are very subject to windfall.

The bio-physical land inventory which was conducted by the Canada-Manitoba Soil Survey and funded by the Study Board has classified the

study area as four land districts and two land regions. Land districts are areas of land within land regions characterized by a distinctive pattern of relief, geology, geomorphology and associated vegetation. (Lacate, 1969). Land regions are defined as areas of land characterized by a distinctive regional climate as expressed by vegetation (Lacate, 1969). They describe the two land regions as follows:

"Boreal-Arctic Land Region (2): Regional vegetation on gently sloping, medium and fine textured materials is open black spruce forest with a ground cover of lichen and low prostrate shrubs. White spruce occurs on flood plains, sand plains and bedrock outcrops; jack pine occurs on the dry sites only in the southern parts. Discontinuous permafrost occurs throughout the Region; common occurrence of wooded mineral and peat palsas as well as mineral soil hummocks. Land sub-Region 2a represents the typic condition of this Land Region while sub-Region 2b is transitional to the Boreal Land Region."

"Boreal Land Region (3): Regional vegetation on gently sloping, medium and fine textured materials is closed black spruce forest with a continuous ground cover of mosses. White spruce and trembling aspen are restricted to lake shores and river courses. Jack pine occupies sand plains and bedrock outcrops. Localized permafrost in mineral materials; but discontinuous occurrence of wooded palsas and peat plateaux with permafrost in organic materials."¹ The four land districts are described below.

¹ Beke, G.J., Veldhuis, H.,
Thie, J.

6.2.1.1 Kame Hills Land District

This area is characterized by extensive gently undulating, to gently rolling glacial drift; muskeg areas of low relief averaging 50 feet, prominent large eskers and kames rising 75 to 100 feet above the local terrain around Kame Hills and north of Moss Lake; and by extensively occurring sandy beaches. Bedrock is infrequently exposed. Black spruce, the majority being 3 inches in diameter and 10 feet in height, comprise the climax vegetation. Jack pine and white birch occur on fire disturbed sites and on sandy to gravelly textured glacio-fluvial deposits mixed with black spruce.

Permafrost occurs throughout this district. In lacustrine areas where the common soils are Cryic Gray Luvisols the active layer is generally between 1 to $1\frac{1}{2}$ feet thick and the ice content is generally high. In depressions or imperfectly drained areas organic deposits overlay the mineral materials producing permafrost of high ice content and mainly palsas and peat plateaux with frequent collapse scars. Here forest cover consists of open to fairly closed black spruce with some white birch.

6.2.1.2 Long Point Land District

"Characterized by extensive lacustrine clay and silt deposits over Precambrian gneissic and granitic bedrock, and thick to thin organic deposits over lacustrine materials. The topography of the lacustrine plains varies from gently undulating to gently rolling, reflecting the configuration of the underlying bedrock which is frequently exposed throughout the area.

Common soils are: Cryic Gray Luvisols and Cryic Low Humic

Eluviated Gleysols.

The climax forest cover is composed of black spruce which, as a result of fire, may be replaced on drier sites by jack pine and white birch.

Permafrost is widespread throughout the district occurring in dry or moist locations and having a moderate ice content. The glacio-fluvial deposits present in this district often have an intermediate vegetation of jack pine and white birch in mixture with black spruce.

Organic deposits occur in the depressional areas and comprise mixtures of palsas, peat plateaux, collapse scars, and small fens. Permafrost with high ice content is widespread in occurrence.

The lakes range in size from small to very large (Southern Indian Lake) with irregular, bedrock-controlled shorelines. Sandy beaches occur throughout the area."²

6.2.1.3 South Bay Land District

"Characterized by extensive Precambrian gneissic and granitic bedrock areas which are overlain by lacustrine and organic deposits, but frequently show exposed bedrock. The remainder consists of thin to thick lacustrine clay and silt deposits, often overlain by thin to thick peat, and infrequent glacio-fluvial deposits consisting of sand and gravel. The strongly bedrock-controlled areas have a topography varying from undulating to rolling. Most of the area has a climax black spruce forest vegetation but a subseral cover of jack pine mixed with white birch occurs in part of the area. Trembling aspen occurs on favourable sites, reaching its northern limit in this district.

² Ibid

Permafrost is found in the thin to thick mineral and organic deposits which may overlay the bedrock.

The lacustrine clay and silt areas have a gently undulating to gently rolling topography. The configuration of the bedrock is often reflected in the topography even when the deposits are relatively thick. Black spruce forms the climax forest cover but subseral jack pine and white birch often occur on the better drained sites. White spruce occurs mixed with black spruce on favourable sites along the shorelines of lakes.

Permafrost is widespread on moist to fresh sites and even occurs on some of the drier sites. Ice content is moderate.

Common soils are: Cryic Gray Luvisols and Cryic Low Humic Eluviated Gleysols.

The organic areas have a low relief and frequently contain permafrost landforms (palsas and peat plateaux). Black spruce mixed with white birch forms the dominant forest cover. Fens and collapse scars occur frequently. They have sedge or sphagnum vegetation with few, if any, trees.

The present vegetation on the glacio-fluvial sand and gravel deposits consists mainly of jack pine but is often mixed with black spruce or has black spruce in the understory.

Common soils are: Degraded Dystric Brunisols with minor amount of Orthic Regosols.

Permafrost is found in more moist locations where organic material has accumulated.

Lakes vary in size from small to very large (Southern Indian Lake)

and are generally deep. The shorelines are irregular and have mainly exposed bedrock and sandy shores."³

Also, of note, are large granodiorite outcrops rising 200 feet above surrounding lakes in the long narrow bays in the north western part of this District. As well, high clay banks are common with several occurrences of varved clays around South Bay.

6.2.1.4 Rat Lake Land District

"Characterized by Precambrian gneissic and granitic bedrock, which is close to or at the surface in the major part of the area, and lacustrine clay and silt deposits and peat deposits overlying lacustrine materials.

The bedrock areas are undulating to moderately rolling; bedrock being frequently exposed. In depressions and on lower slopes the bedrock is covered by thin to thick lacustrine materials which, in turn, are overlain by organic deposits in depressions. The dry sites generally have a subseral jack pine cover with black spruce, jack pine, white birch and trembling aspen. In poorly to very poorly drained locations the tree cover is stunted black spruce mixed with often tall willow and alder.

Permafrost occurs on the slopes and in depressions, mainly under or in thick organic layers and has a medium to high ice content.

The lacustrine areas have a topography ranging from gently undulating to gently rolling, depending on the degree of control by the underlying bedrock. The forest cover is mainly black spruce, which may be replaced (as the result of fire) by jack pine and white birch on the drier sites and by trembling aspen on fresh to moist location.

³ Ibid

Permafrost is found throughout but occurs mainly on sites with a thick LFH or peaty layer. Ice content is moderate to high.

The organic areas have a low relief. The very wet peat areas have a sedge vegetation. A forest cover of black spruce, mixed with white birch is found on the raised peat landforms. The ice content of the permafrost in peat palsas and peat plateaux is high.

Many lakes occur in this district which vary in size from small to moderately large, and are deep, and contain many rocky islands. Shore materials are mainly bedrock, clay or organic in nature.⁴

Soil conditions for more specific sites in the study area have also been described. Some areas expected to require such site specific information are those closest to vehicular access points. The Leaf Rapids area, Barrington River access point, South Bay and South Indian Lake settlement are examples.

Favorable soils are found in the Leaf Rapids area. They include a deep coarse and medium textured sand deposit associated with the north-northeast by south-southwest aligned esker. The area immediately east and south of the townsite is more than half shallow, highly calcareous clay with silt loam and sand having localized permafrost (less than 15 percent).

The remaining area is of the same soil composition, displays less topographic relief and has discontinuous zones of permafrost, (less than 50 percent in the landform component). Paralleling the Churchill River the landforms are of similar composition to those to the south but are in deep and shallow deposits.

⁴ Ibid

The vegetation of the area is also favorable with local mixed stands of jack pine, white spruce, black spruce and trembling aspen.

6.2.2 Fauna

Moose populations at the northern end of Southern Indian Lake are quite large. Hunting at the present time is limited to casual hunting by the natives who take about 30 animals per year. Population densities are unknown, but they could possibly support sport hunting on a limited basis.

There are barren ground caribou in the area. Their range is dependent upon population and food supply. For the last 20 to 25 years they have not come much south of Missi Falls. However, if their numbers increase substantially they could again come south to their old range.

The area is not an important waterfowl breeding area and is not important as a stopover on migration routes, although in the fall some waterfowl do stopover on their way south. The total number of breeding birds would not be much above 2,500.

6.2.3 Water Characteristics

At present (1973) Southern Indian Lake would appear to have normal clarity for a typical shield lake. Visibility is about eighteen inches and decreases steadily with depth. Productivity is average and algae growth combined with suspended sediments gives the water its characteristic muddy green colour. The water away from the settlement areas is generally potable without treatment or boiling. Residents use the water from anywhere on the lake without treatment.

Some doubt can be cast on the quality of water in the Leaf Rapids inlet. The town sewage plant discharges treated effluent into this inlet. When fully treated this should not smell but this was not the case in August, 1973. Even if fully treated, nutrient level would be quite high resulting in higher algae and aquatic plant growth in the inlet where water movement would be minimal. Finally, this discharge would adversely affect the desirability of the area for swimming, once it became public knowledge.

Rinse water from the Southern Indian Lake Fish Co-op packing plant is discharged into the Churchill River at the plant site. Human wastes are discharged into a septic field.

6.2.4 Historic and Archaeologic Highlights

The study area contains six sites which display some importance in uncovering Manitoba's history and prehistory. These sites are at Leaf Rapids, McBride-Barrington River, Poplar Point, South Bay, Sandhill Bay and Kame Hills.

The sites at Leaf Rapids are at the upper and lower end of the portage and could give a potential record from the Middle Prehistoric Period to the present. The peninsula on the left bank just below Leaf Rapids contains sites which are late Prehistoric Period manifestation.

One site in the Poplar Point area appears to be the location of a North West Company trading post visited by David Thompson in 1805, the other sites yielded Middle and Late Prehistoric Period artifacts and possible Paleo-Indian artifacts.

The Kame Hills area contains some fourteen sites ranging in size

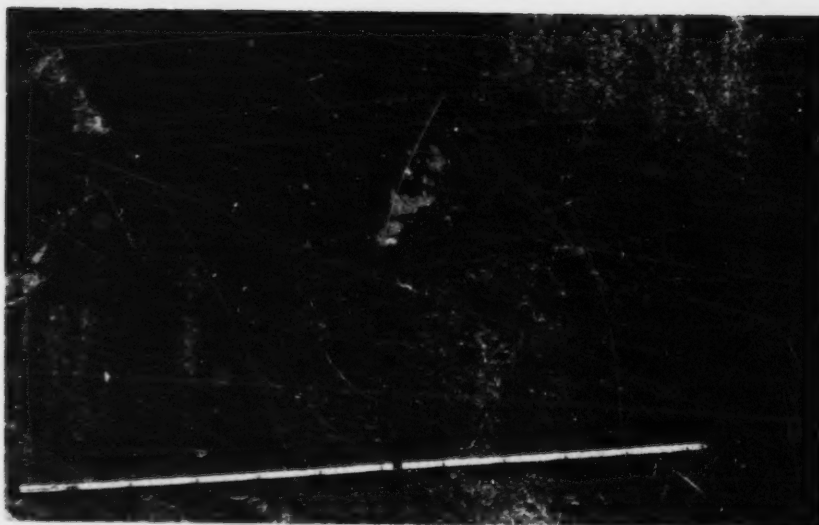


PLATE 1

Pictograph Churchill River below Leaf Rapids. Four figures. Two stick figures of caribou, one partially encircled. An X is above the second figure, the third is only partially completed, the fourth is indistinguishable.

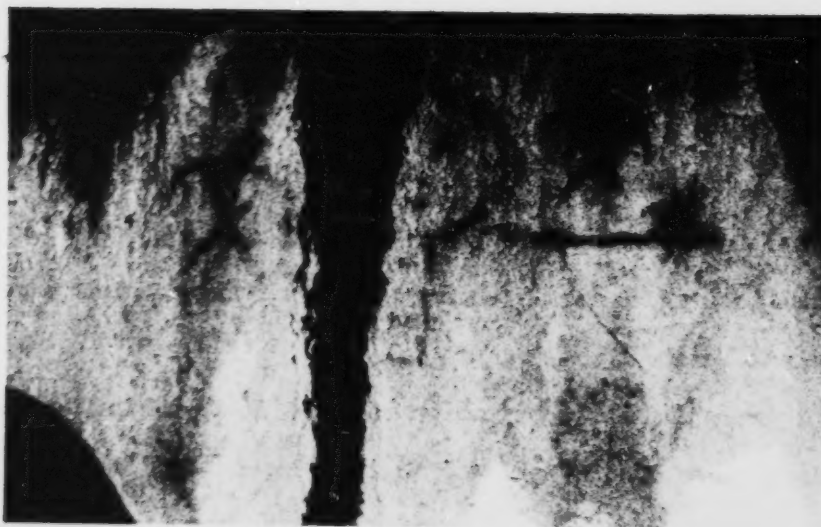


PLATE 2

Pictograph Churchill River below Leaf Rapids. Two thunderbirds flanking a head. A pipe lies beneath one of the thunderbirds next to the head. A large stain obscures one side of the head.

from less than an acre to over thirty-five acres. It represents a most exciting find for both Manitoba and Canadian archaeological circles. The scattered distribution of the sites in a narrow channel of the lake resembles the scattered nature of the residences, churches and stores of the present community of South Indian Lake.

The large sites are a radical departure from the small sites previously recorded both on Southern Indian Lake and in the Boreal Forest areas. There appears to be excellent potential in this location for collecting data on past community patterns.

Three pictograph sites are found on the right bank of the Churchill River some 2, 2½ and 5 miles below Leaf Rapids.

6.2.5 Climate¹

The study area has a continental climate. Temperatures range from 100°F in the summer to -60°F in the winter.

Daytime temperatures usually begin a warming trend in April and by mid-June the mean daily temperature has risen close to a comfortable 58°F. Hot, clear days and cool, clear nights are fairly typical of July and August. September and October can bring some of the most pleasant weather but are generally cool and damp. The rest of the year finds the region firmly entrenched in winter and clear sunny days would seem to be the norm.

Mean annual precipitation is about 16 to 17 inches, with mean annual snowfall in the 45 to 50 inch range, with degree days² being

¹ T. R. Weir (ed). Economic Atlas of Manitoba. Dept. Industry & Commerce, Wpg. 1960. p.18.

² A degree day is a unit that represents one degree of declination from a given point (43°F) in the mean daily outdoor temperature.

between 1200 and 1600. The frost free days number between 70 and 90 days and the ice free days about 163.

In general the summer temperatures in the study area can be considered conducive to the enjoyment of outdoor recreational activities. The cold winter temperatures can be a detriment but they can also be exhilarating with the use of proper winter clothing and the recent innovations in winter recreational equipment and facilities.

The water temperatures are high enough even on the large lakes, during July and August, for swimming and water sports from the scattered sand beaches.

Movement by boat on the lakes is possible by June 1 when only scattered ice floes remain.

6.2.6 Scenic Quality

Scenic quality or aesthetic appeal is a resource which greatly influences the recreation capability of an area. Just as there are varying economic values relating to the land surface so also are there varying scenic values.

Scenic quality is at first thought an immeasurable quality. Not only does scenic value vary between scenes but also within the same scene as well as within "the eye of the beholder". Appearance will change depending on the mental attitude of the viewer, the weather conditions and the light conditions.

Areas which may appear breathtaking and spectacular covered with a blanket of snow and in dazzling sunshine, on an overcast day may simply be cold and dismal. Marshes or swamps with drowned timber which in the full light appear as an eyesore, in the first rays

of the morning sun with the outlines shrouded in rising mist take on an ethereal ephemeral quality which is lost as the mist dissipates and the sun rises. A large beach area backed by an impressive stand of trees will appear much more pleasant in full sunlight on a warm clear day than it does on a cold, wet, overcast day.

It is possible, however, to objectively evaluate and compare landscapes as to scenic value by comparing directly measurable qualities such as changes in topographic relief and diversity within the landscape unit. Scenic value increases as the topographic relief increases. This can be measured from topographic maps and by on site examination. As the diversity of a scene increases so does its scenic value. Diversity is created when there is a mixed vegetation stand. This can be measured directly from forest inventory maps supplemented by on site examination. Diversity is also created when another dimension is added to a landscape. For instance, a scene composed of water, forest and sky would not have as great a scenic value as one composed of water, rock, sand beach, forest and sky.

In a study such as this, having a scale for scenic value which could be attached to the landscape units would first aid in identifying the areas having the highest recreation capability. Following this, it could also then be determined which areas would suffer the greatest loss in scenic value due to flooded timber once the lake level was changed. We could also compare this to other lakes to determine which system would be the most compatible for hydro-electric development. Finally, after weighing scenic value along with the other components and constraints which determine the recreation

potential of an area, we could direct mitigation or enhancement practices such as pre-flood timber clearing or dyke building to the most suitable places.

In the Outlet Lakes section of the Lake Winnipeg, Churchill and Nelson Rivers Study a Landscape Unit map was prepared. Landscape units are areas of land and water which are grouped together on the basis of physiographic characteristics. Unfortunately this was not done for the Southern Indian Lake study area. As well, a shoreline inventory which would help in evaluating shoreline scenic value was not available at the time of writing this report. These procedures could be kept in mind and evaluated for practicability in future studies of this nature; but the scenic evaluation for this report will have to suffice in the manner given below, using the biophysical land districts as the units of discussion and the water body as the viewing point.

6.2.6.1 Kame Hills Land District

This District is generally of low topographic relief with very little diversity in vegetation. However, the views from and of the 75 to 100 foot kames and eskers towards the northern end of Southern Indian Lake and the extensive sand beaches create many localized pockets of high scenic value within a generally visually bland area.

6.2.6.2 Long Point Land District

Missi Falls, the outlet of Southern Indian Lake, would be the most attractive single feature in this District. The general topographic relief in this land district, south of Long Point, is somewhat

greater than the Kame Hills Land District. Also adding to its overall higher scenic value is the more frequent exposure of bedrock.

6.2.6.3 South Bay Land Districts

Glacio-fluvial deposits occur less frequently in this Land District than in the two Districts to the north. Sand beaches are less common as well. However, this Land District ranks higher in scenic value than the other two. In part, owing to the greater topographic relief which varies from undulating to rolling; a greater vegetation diversity; and frequently exposed bedrock.

Extensive bedrock controlled shoreline, a diverse vegetative cover, an esker, and several sand beaches formed by this esker give above average scenic value to the Barrington River portion of the study area. Of interest one half mile upstream from the barge landing are the rapids which bring these waters to the level of Opachuanau Lake.

The vicinity of South Indian Lake settlement has a high scenic value with much exposed bedrock and sheer rock faces. The presence of buildings and human activity interrupts the wilderness quality of this area, but the presence of a northern Manitoba culture, depending upon the attitude of the viewer, can overshadow this fault. Certainly the scene of a trapper's log cabin, as encountered occasionally anywhere on Southern Indian Lake, is of cultural and some scenic value.

The highest scenic values of the entire Southern Indian Lake area are exhibited in the region of long narrow bays in the northwestern part of the South Bay Land District. Here large granodiorite outcrops rise 200 feet above the surrounding lakes. As well, the



PLATE 3

Boulder strewn shoreline predominates along the Churchill River and Opachuanau Lake. Shoreline access is difficult.



PLATE 4

Sand beaches formed from eskers are found on the Barrington and Churchill Rivers. These should reform quickly after flooding. Access is limited to boats.



PLATE 5

Rapids on the Barrington River. High quality sport fishing areas such as this are expected to attract anglers in increasing numbers.



PLATE 6

Opachuanau Lake sand beach. Primitive camping is a popular pastime, however, campsites are relatively scarce. Flooding will reduce the quality of this experience.

most northerly stands of aspen and thus mixed wood forests occur in this area. The fact that both shorelines are quite visible at all times and that vistas are created by the narrow channels and large islands adds much to the scenic value of this area.

6.2.6.4 Rat Lake Land District

This District is entirely a river landscape from Opachuanau Lake to Granville Lake and as such possesses many of the attributes of the long narrow bays described above. Topographic relief is not as great, however, but scenic value is locally increased by the variety of vegetation near the river's edge and the presence of more frequent sandy bays. The boiling movement of water through narrow channels at several points along this river adds scenic value in those areas. Leaf Rapids, a spectacular white water drop of about 8 feet divided by an island, has the highest scenic value of this District. The ridge which produces this water drop also forms a peninsula and narrow bay which proceed south westerly to the Leaf Rapids townsite. These areas also have high scenic value with exposed rock controlled shoreline and a diverse vegetative stand.

The large esker on which Leaf Rapids townsite has been built is a very prominent topographic feature. It meets the Churchill River just upstream from the peninsula and water falls and it is here that a bridge for Highway 391 to Lynn Lake crosses.

6.3 TRANSPORTATION INFRASTRUCTURE

The greater part of the Southern Indian Lake study area is remote from major transportation routes. By the spring of 1974,

however, all major settlements should have reliable connections with the south.

Some sixty air miles west of Southern Indian Lake is Lynn Lake a mining town with a population of 3,500. The main industry is mining, but the town is becoming increasingly important as a jump off point for hunters and fishermen flying in to remote lakes.

Leaf Rapids is a new mining town built to serve the Sherritt-Gordon mine at Ruttan Lake, twelve miles east of the town. Its present population of 3,000 is expected to increase to 15,000 in the next three to five years.

South Indian Lake is a settlement of approximately 500 people. The main occupations are commercial fishing and trapping. The extension of the Ruttan Lake road to South Bay for the hydro project may eventually be further extended to South Indian Lake providing road access to Lynn Lake, Leaf Rapids, Thompson and points south.

Nelson House is a settlement about fifty miles by road from Thompson. Its present population, about 1,300, is comprised mainly of Indians. Some of the men work at Thompson for Inco and some subsist on trapping, fishing and odd jobs. There is no local industry and employment opportunities are scarce.

Thompson is the main centre in the north supporting a population of 19,000. It is principally a mining town supported by Inco. Its transportation infrastructure is complete as it is served by paved all-weather road, rail and air.

The extension of Provincial Road 391 from Thompson to Lynn Lake should be graded to Provincial Road standards by spring, 1974 giving

the residents of Lynn Lake and Leaf Rapids road access to Thompson and the south. An extension of this road to the Nelson House Indian Reserve gives the inhabitants year round road access to Thompson.

Both Thompson and Lynn Lake are served by C.N.R., Thompson by a branch of the Hudson Bay Railway to Churchill and Lynn Lake by a branch of the C.N. line from The Pas and Flin Flon.

In 1973, the Southern Indian Lake Co-operative Fisheries operated two fish collection and supply boats which plied the lake from Leaf Rapids to Loon Narrows. Each boat is capable of transporting 20,000 lbs. of fish or supplies. Suitable docks have been constructed at Leaf Rapids and Loon Narrows.

Manitoba Hydro is operating a tug-barge on the lake transporting supplies and material to South Bay and Missi Falls. In anticipation of major barge traffic to Missi Falls, Hydro has constructed a major docking facility at South Bay.

The channel from Leaf Rapids to Loon Narrows has been buoyed and is fairly safe. From Leaf Rapids to Opachuanau Lake there are several narrow stretches of fast water which must be negotiated. The open water season on the lake extends from the first week in June to about the last week in October.

The study area is also served by 21 airlines flying scheduled flights and charter service. These are based in Lynn Lake, Maboowien, Ilford, Thompson, Garden Hill, Sherridon, Norway House, Channing, Gods Lake, Churchill, The Pas. The season for float planes is the last week of May to the end of October. All major centres are

served by float plane and land based aircraft. A major airstrip was planned for Missi Falls by the fall of 1973. Until then it was served by float equipped aircraft.

Thompson and Lynn Lake have the only two paved landing strips operating under I.F.R. (instrument flying rules) and capable of handling planes such as DC8's and 737's.

Air access will continue to play a very important role in northern Manitoba as regular and charter access is provided to communities in the region, and as air service grows it will play a larger role in pleasure and vacation travel.

Until recently, the tourist traffic has concentrated in The Pas-Flin Flon area, moving only a short distance on Provincial Road 391. As the paving of Provincial Road 391 and PTH 6 continues, increasing amounts of traffic move out along these routes. The extension of 391 to Leaf Rapids and Lynn Lake could open up great potential to these communities as well as Nelson House.

The area is served by 1,039 miles of rail operated by the C.N.R. There were approximately 50,000 passenger boardings in 1972. However, the demand for rail passenger service by those seeking recreational experiences is declining in the rest of Canada and with the extension and paving of roads and increased air service in the north, the same fate may be in store for northern rail passenger service. Intra-regional service could be better provided by bus. There are already seven bus lines in the region serving various communities.

6.4 RESOURCE USE

This section is a summary of resource use in the study area. Resource use affects the allocation of recreation sites and must be considered in the formulation of the master plans.

6.4.1 Commercial Fishing

The commercial fishing industry on Southern Indian Lake and environs produces an annual catch of 1,000,000 pounds of fish. Over 90% of this catch is whitefish with the rest consisting of walleye, northern pike and sauger.

There are fish collection stations at the north end of the lake, at Loon Narrows and at South Indian Lake settlement. The cleaned and iced fish are collected by refrigerated boats in summer and taken to the processing plant at Leaf Rapids; in the winter the catch is flown in. At the fish plant they are packed as to species and size, re-iced, then shipped by truck to Lynn Lake, and train to Winnipeg. With the completion of P.R. 391, the entire trip to Winnipeg can be made by truck, thus decreasing the handling and freight costs.

6.4.2 Forestry

The entire area to be affected by the flooding falls within a Churchill Forest Industries (Manitoba Forestry Resources Ltd.) berth. The area, however, is too inaccessible for commercial forest operations, and the merchantable timber stands too far scattered to make for a viable operation, even if access was available.

The present forestry operations are limited to the need for building materials and fuel for residents of the various communities.

The potential merchantable timber lies south of the present study area along the diversion route.¹

6.4.3 Mining

The most important mines are those around Thompson operated by International Nickel, and the Sherritt-Gordon mine at Rattan Lake. It does not appear that either of these mines will be affected by the flooding. From information in various geologic reports, it does not appear that there are any large mineral deposits in the area or its immediate environs that would be flooded. It would appear that the opening of another mine is not a prospect for the near future.

6.4.4 Trapping

The traplines, while not producing a great deal of money, do provide a necessary cash inflow into the settlement of South Indian Lake. Statistics for the 1970-71 season indicate a total value at South Indian Lake of \$32,714.06 to the trappers.² The furs are flown to Lynn Lake and are then shipped by rail to Winnipeg.³ It is unlikely that P.R. 391 will have any effect on the existing method of transporting furs. Some damage to traplines may result from the flooding.

6.4.5 Quarrying

Various quarrying operations are being carried on at the present time for clay, gravel and sand in conjunction with road building, dam construction and construction materials in Leaf Rapids.

¹ Forestry Branch, Dept. of Mines, Resources and Environmental Management.

² Manitoba Dept. of Mines, Resources & Environmental Management.

³ Hudson's Bay Company, Northern Stores.

Canada Concrete has a pit located at township 87, range 16. The contract allow for the removal of 150,000 cubic yards of material by March 31, 1974. A second reserve is registered in the same area for the removal of an additional 100,000 cubic yards by the same date.

Pneumatic Drilling and Blasting Limited has a reserve in section 30, township 86, range 16. This calls for the removal of 15,000 cubic yards by March 13, 1974.

J. C. Construction Company Limited has a reserve in township 86, range 17. The pit, however, is located 1,000 yards east of Provincial Road 391 and 500 feet north of the Hydro substation which is located in N $\frac{1}{2}$ NE24 and S $\frac{1}{2}$ SE 25 township 86, range 17. The pit is therefore in township 86, range 16. The reserve allows for the removal of 10,000 cubic yards by December 31, 1973.

J. C. Wilson Construction Company has a reserve registered in township 87, range 13. The pit locations are 6.6 miles and 12 miles northeast of the Ruttan Lake mine and are in township 86, range 14. The reserve allows for the removal of 20,000 cubic yards of material by December 31, 1973.

Pits being used by the Manitoba Department of Highways begin within the 300 foot right-of-way allowance but extend beyond this in most cases.

6.4.6 Sport Fishing¹

There has never been an active sport fishing lodge on Southern Indian Lake or Opachuanau Lake. The present sport fishing is limited

¹ Kenneth V. Weagle,
Warren Baxter

The Fisheries of Southern Indian Lake:
Exploitation and Reproduction. Environment
Canada. Wpg. Oct. 1973. section 6.

to an area immediately upstream and downstream from Leaf Rapids, the Barrington River where a summer cabin is owned by an American, and a few tourists who pass through the region.

One can angle for northern pike almost anywhere on Opachuanau and Southern Indian lakes. The average success rate for northerns recorded in summer, 1972 was 2.1 fish per rod hour, with an average length of 21.6 inches. When good pike habitat was fished, success rates of 4.0 to 5.5 fish per rod hour were recorded.

Walleye are more selective in habitat and were most often caught at the mouths of rivers. The highest success rate was 9.5 fish per rod hour with an average weight of 22 ounces.

The above figures suggest that fishing success on the lakes could be even higher. When "hot" spots were encountered, 12 pound pike were not uncommon.

There is a very high potential on both Opachuanau and Southern Indian lakes for trophy northern pike fishing. The pike production is excellent and good habitat is readily available in all parts of the lakes. The pike are not only large but very numerous.

The potential of the walleye sport fishery is limited by the remoteness of the better areas and the small size of the fish. Although walleye may not be the main attraction they do present an attractive alternative to the sport fisherman.

Studies in 1970 by Underwood and McLellan² showed the potential for a Southern Indian Lake pike fishery to be better for trophy

² Underwood, McLellan &
Assoc. Ltd.

Churchill River Diversion: Study of
Alternative Diversions. Underwood,
McLellan & Assoc. Ltd. Wpg. 1970.

pike than in Reed Lake, which at the time was the major trophy pike lake in Manitoba. The present study shows the potential to be even higher.

6.4.7 Hunting

At present only the people of South Indian Lake participate in hunting. They take an estimated 30 moose or caribou per year to satisfy their fresh meat requirements. In terms of value to the settlement the hunting is worth about \$15,000 in fresh meat. It has been estimated that about 100 moose could be taken by sport hunters with a value of about \$50,000 per year to the area.¹

Waterfowl are limited and do not exist in large enough numbers to support a viable sport hunting operation. They would provide a local opportunity for residents of Leaf Rapids.

6.5 OUTDOOR RECREATION CAPABILITY

This section discusses the outdoor recreation potential of the study area by means of several methods of analysis. These methods include shoreline classification; examination within the bounds of National, Provincial and Regional Park criteria; examination of its capability for outdoor recreation as non-designated recreation land; and examination of its suitability for commercially promoted forms of outdoor recreation.

6.5.1 Shoreline Classification

Unfortunately the shoreline analysis with prediction of flood consequences as begun by Newbury et al and continued by the Manitoba

¹ H. E. Welch, K. W. Stewart,
Yates M. Barber Jr.

Possible Changes in the Natural
Resources of Southern Indian Lake
as a Result of the Churchill River
Diversion. Winnipeg. Nov. 1966. p.25.

Water Resources Branch was not available for the writing of this report. Some preliminary data completed for the Churchill River from Opachuanau Lake upstream to the first set of rapids was available. The data facilitated a general assessment of the recreation capacity of some of the shoreline on Southern Indian Lake.

The study area lies within the Canadian Shield and is underlain dominantly by granitic bedrock, with wide belts of gneissic and volcanic bedrock. This is generally overlain with a thin mantle of clay in the south and glacial drift material in the north. The bedrock outcrops and is exposed along stream and lake shores.

The dominant shoreline feature of the study area is the extreme irregularity of the shore with many bays and inlets, smooth outcrop shores, boulder and cobble beaches, and numerous reefs and shoals. The tumbled bedrock shore and the presence of extensive rock shelves makes it difficult to get any closer than 30 to 40 feet to shore in many areas.

On the Churchill River below Leaf Rapids, the dominant shoreline type is low bedrock associated with bedrock shorelines having small overburden beaches, and boulder shorelines. There are minor occurrence of low alluvium, low willow marsh and fen shorelines in small bays along the river. In the back of a bay approximately six miles upriver from Opachuanau Lake, an esker has been eroded and a sand shoreline created.

On Opachuanau Lake, the dominant shoreline is again low bedrock interrupted by overburden beaches, and boulder shore. There

are some scattered occurrences of moderate alluvial shores and low willow usually in sheltered bays and inlets; marsh areas usually occur at river mouths. Due to the nature of the boulder areas and the extensive rock shoals and shelves extending from the shore, landing places are difficult to find and it is extremely hazardous to hug the shoreline in bad weather.

All islands are bedrock controlled and few if any can be approached with relative ease.

On the Barrington River, the low bedrock shore is again dominant. On the north shore just past the fish camp is an area where boulder and low alluvial shorelines dominate. A couple of stretches of steep bedrock shore exist at the entrance to the bay before the rapids. Both this bay and the rapid area are dominated by low bedrock and overburden beach shoreline.

The south basin of Southern Indian Lake is extensively bedrock controlled. There are numerous bays and inlets and it appears that over 90% of the shore is low bedrock and overburden beach. There are scattered marsh and low alluvial shores in the bays. Finding landing or campsites in this area is extremely difficult.

The north basin from the Sandhill Bay area north is also bedrock controlled but here the relief is lower and the presence of large eskers and drift areas which are subject to erosion cause a very large number of sand and gravel beaches. Shoals are very common and access is difficult in rough weather due to the gentle incline of the beaches which causes grounding sometimes 30 to 40 feet from shore. However,

the availability of camping and landing areas is much better in this section of the lake. This is also the widest and least sheltered area of the lake due to the smoother less indented nature of the shore and fewer islands than the south basin.

6.5.2 Suitability for a National Park

The National and Historic Parks Branch has identified the Natural Regions and Natural History Themes worthy of representation in the National Parks System of Canada.¹ Southern Indian Lake lies within the northwestern Boreal Uplands natural region. Some representation of this region is made in the Great Slave Lake National Park reserve. This emphasizes the northern portion of this natural region; however, the dominant feature of the southern portion is the Churchill River. Thus, it is possible that Southern Indian Lake could be a target for National Park representation, the strong feature being the Churchill River itself. An informal study was done by National Parks, Manitoba Parks Branch and Manitoba Department of Mines, Resources and Environmental Management. The study concluded that this portion of the Churchill River was not suitable for a National Park based on scenery and recreational opportunity. As well, commercial fishing on the lake would have likely been considered incompatible with a national park.

Formal investigations are being conducted by the National and Historic Parks Branch and the Province of Saskatchewan on the Churchill River in Saskatchewan.

Interest in the representation of the Churchill River System, per se, within the National Park System would also likely be focussed

¹ National and Historic Parks Branch. Unpublished document. National Parks System Planning Manual. Sept. 1971.

downstream on the Hudson-James Bay Lowlands Natural Region and the Hudson Bay Inland Sea Marine Natural Regions. The biotic features as well as the physiographic area and significant river representation would favor National Park designation for this area. If the river diversion significantly changes the biota of this natural region no attempts at procurement would likely be initiated.

6.5.3 Suitability for a Provincial Park

There are six categories of park within the provincial park classification system. Land areas must meet certain criteria before being assigned to any particular classification. The aims of the Parks Branch are to provide for the citizens and visitors to the Province the means and the opportunities to understand, appreciate and enjoy the recreational resources of Manitoba.

The park system serves both a social and an economic role. Some elements of the system have been established purely for preservation purposes - to protect the unique natural and historical features of the Province. Other units have been designated and developed purely to serve large scale recreational needs.

There are several other park types besides the preservation oriented one and the recreation oriented type. The Park Lands Act of 1972 sets out a new way of describing parks based on what uses the individual areas can best serve. These include:

6.5.3.1 The Natural Park

The Natural Park is designated primarily because of the quality of the resources. The areas possess qualities which best illustrate

the natural features of the Province. They may contain such aspects as outstanding geological formations, ecological communities, physiographic regions or exceptional scenic beauty.

The concept of, use and development of natural parks is:

- (a) to utilize an area within its natural carrying capacity, and
- (b) to design and use an area in harmony with the natural features.

Southern Indian Lake, while possessing several areas of great natural beauty, generally possesses only average scenery for the region. Many large burns of the past and recent forest fires have left extensive areas under scrub regeneration forest, areas which have been denuded to the underlying bedrock and areas which are tangles of fire blackened stumps and shrub growth. The remaining vegetation is generally black spruce forest with the trees less than 3 inches in diameter and about 10 feet in height. In the northwest, the area is covered by glacial drift and trees cover only about 5% of the area.

As indicated, the lake is not without its beauty spots. The narrow bays area to the west offers sheltered boating, good fishing and some lovely scenery. It is, however, remote and requires either a plane or large boat for access. Minor scenic areas also exist at Missi Falls, Leaf Rapids and the rapids on the Barrington River; the main aspect of these areas is the rapids or falls.

There are no unusual or unique landforms in the area. There are a few scattered eskers usually associated with small sand beaches and some evidence of glaciation. These features are, however, much more significant to the north of the present study area.

Evidence of human occupation is also very pronounced in the form of fish camps which service the present commercial fishing industry, abandoned fishing camps and trappers cabins, and cabins still in use on traplines. Most of these facilities are surrounded by large cleared areas which detract from the wilderness or natural quality.

The area south of Long Point is an example of northern transition forest which is as yet not represented in either the National or Provincial Park systems. It is, however, not a prime example due to fires and much better representation exists to the east around Gauer Lake.

There is no evidence of unique ecological communities and these must be assumed to be absent until contrary evidence is presented.

Wildlife, especially moose, appear to exist in normal concentrations, but due to hunting pressure are wary except in the fall.

Caribou used to come as far south as the settlement of South Indian Lake, but none have been seen south of Long Point in the last 20 years. Recent surveys indicate that they may be increasing and moving south again.

Local furbearers would appear to be plentiful and trapping is worth about \$32,000 annually to the community.

There have been scattered sightings of bald eagles. From personal observation it would appear that there is at least one breeding pair on each of the major lakes.

There have been major archaeological finds in the Kame Hills area, the Sandhill Bay area and the Leaf Rapids portage. They have

been described as being extremely important in interpreting Manitoba's pre-history.

6.5.3.2 The Wilderness Park

A Wilderness Park must possess the same type of natural qualities as a Natural Park. The difference between the two is in the level of development and intensity of use. Generally speaking, wilderness parks are for low density "primitive" type use.

Much the same criticism as for a Natural Park exists for making Southern Indian Lake a wilderness area. Human evidence over most of the lake is too pronounced for wilderness use. Mechanized transport in the form of tugs and barges hauling freight, Co-op fishery boats collecting fish and supplying the fish plants, float planes and ski planes hauling freight and people, winter tractor roads for hauling supplies, the normal commercial fishing and transportation on the lake, all detract from the wilderness aspect.

A wilderness area could be designated in the narrow bays area on the west side, but again mechanized transport is necessary for access and to get around within the area.

The remainder of the lake is too large and too important a source of income and transportation to attempt to restrict it to use by non-motorized vehicles.

6.5.3.3 The Recreation Park

This category of park is an area having resources of provincial significance capable of providing outdoor recreation opportunities for large numbers of people in a natural setting. This type of park is located in close proximity to population centres.

The Southern Indian Lake area is too remote from major population centres and major travel routes to serve as a recreational park. It is capable of supporting a moderate degree of use for cottaging and related activities, but better areas exist closer to the centres of Leaf Rapids and Lynn Lake. The Southern Indian Lake region is best suited to limited extensive use for fishing, hunting, some boating and weekend camping.

6.5.3.4 The Heritage Park

A Heritage Park is one which is established for its human history or unique natural value or quality in illustrating or interpreting our provincial heritage and not for its recreational significance.

There are some areas which have significance as heritage areas. These are the major archaeological sites at the Kame Hills area, the Sandhill Bay area and the Leaf Rapids portage site. These three sites are important and could provide a valuable insight into Manitoba's pre-history. There is also a possible historic site in the form of a fort or trading post on Opachuanau Lake if the location can be verified.

6.5.3.5 Wayside Area

The road from Leaf Rapids to South Bay is bound to draw traffic both from P.R. 391 and from Leaf Rapids even if this trip is made just to see what is at the end of the road. If the road is eventually extended to South Indian Lake settlement, a wayside picnic area may be required to serve transients. This could be located either in the settlement or at South Bay. Assuming that many of these people will bring boats, the South Bay area would seem more suited to this type

of facility, since a Manitoba Hydro dock is already situated here. This would give easy access both to Southern Indian Lake and to the Rat River system via the diversion channel.

A transient campground may also be necessary in the area to serve weekend or weeklong campers. Since Leaf Rapids, when completed, is supposed to contain a smaller percentage of single men than other mining towns, the facilities should be family oriented with a higher level of services.

Wayside facilities should also be considered where the road passes close to small lakes or crosses rivers such as the Vermilion River. The Vermilion River provides access by boat to Rusty Lake and several small unnamed lakes along its course. The Lynn Lake section of P.R. 391 passes close to a small unnamed lake about ten miles north of Leaf Rapids which is reported to be good for pickerel fishing.

6.5.4 Suitability for a Municipal or Regional Park

A regional park is a recreation area which is oriented primarily to a local population. Usually the resource base for such a park is not of provincial significance, but the site chosen ideally would possess natural beauty, be within 25 miles of the population it serves and be capable of supporting intensive forms of outdoor recreation. The size of regional parks and the facilities to be provided should be flexible depending on local roads, natural amenities, and adjacent recreation facilities. Such a park could provide camping and picnic areas, beaches, open space for play, hiking, nature trails, bicycle paths and car parking lots.

A Provincial Park planned for the Hughes, Eden and Stag Lake areas will partially fill the local needs of Leaf Rapids where a population of 15,000 is expected. In addition, an existing beach and sports area has been developed on Turnbull Lake, three miles south of Leaf Rapids. Located on an esker, the beach material is favorable; however, Turnbull Lake is of marginal recreation capability because of shallowness and poor water quality.

A prime area for development of a regional park exists on the peninsula and inlet of the Churchill River which reaches back into the town of Leaf Rapids. Hiking trails and a road with primitive boat docking facilities already exist. The area has been designated as town green space on the plan. Some drawbacks exist in this area. The treated but odiferous sewage from this modern town drains into the inlet. A concrete mixing plant occupies the bottom end of the inlet to the north side of the Rattan Lake road. Water depth in the inlet is insufficient for swimming or utilizing the potential beach of the sandy loam and sand found around the southern portion of the inlet. Despite these drawbacks, this peninsula and inlet are attractive areas with bedrock controlled shoreline along their northern half. The vegetation is a mixed stand of aspen, white and black spruce, and jack pine. On the tip of the peninsula is the portage trail and eight foot Leaf Rapids. The crest of these falls is approximately 849 feet above sea level.

A boat launch is urgently required in close proximity to the townsite. At present with about 3,000 people there are about 200

boats in the town. As the population increases, so should per capita boat ownership, and a commercial marina operation where people would feel secure in leaving their boats could be an asset. The inlet is presently used for boat beaching to some extent but the inlet is bordering on the shallow side, especially at low flows. Even if the area was deep enough, such a facility might conflict with other uses, such as canoeing, in this narrow bay. Parking and road space would also be cramped and any expansion of this form of infrastructure from the present level would seriously conflict with the hiking trail and natural setting presently there. A marina facility would likely be more compatible with the area immediately downstream from and to the south side of the bridge. This marina and one near the campground which is being constructed approximately 3 miles upstream from the bridge would better serve the visiting users. Boat access for travel downstream from the water falls could be obtained at the Co-op Fish Plant or by construction of an elaborate winch or lock type portage on the north side of the rapids.

6.5.5 Suitability for Non-Designated Recreation Land

Recreation potential is not found only in areas which can be specifically designated as "parks". The theory of designation as a park area may be the wrong approach. Formal designation as one or other type of park would in the end restrict its use to some extent, when an area is capable of meeting limited use for all types of recreation. Designation may also result in overuse by providing facilities and access routes, thus diminishing the overall recreational experience.

As well, public concern over the destruction and degradation of wilderness areas is growing and pressure groups are becoming more vocal. This public concern is reflected in an evolving Manitoba Parks Branch policy of commenting on and recommending proper land use practices, and taking up issues of aesthetic and environmental concern not only on "park" areas but all provincial land. Indeed if enlightened land use planning with proper regard for aesthetics were to become the rule it may become unnecessary to designate specific blocks of land as "Park". The exception would be the natural areas which are set aside as biological benchmarks.

Some areas of Southern Indian Lake are suitable for wilderness camping, but either a float-plane or a large boat is necessary to reach them. The lake already has a flourishing commercial fishery and the possibility for lodge use of some of the bays on the west side exists. Here it would not conflict with the commercial fishery and would have the wilderness aspect necessary for a fly-in lodge.

The northern area of the lake is dotted with many fine sand beaches which would make excellent campsites for a few days or a week. However, a float-plane or a large boat is necessary to reach them due to the size and treacherous nature of the lake.

Fishing excursions using cabins situated at river mouths where the fishing has proven to be good could also be promoted. The Co-op fishery at Leaf Rapids is interested in using its supply vessels for this purpose. Fishermen would be dropped off and picked up in two days to a weeks time.

Extensive use is already made of Opachuanau Lake, the Barrington River and Southern Indian Lake by the people of Leaf Rapids who come up by boat to fish, hunt, picnic or for weekend camping trips. Many people simply come to see what is at South Indian Lake.

6.6 MASTER PLAN FOR OUTDOOR RECREATION IN THE STUDY AREA

This plan is a comprehensive description of the recreational opportunities available within the study area. These opportunities are based on a thorough assessment of the natural resources and on site examination of the area. This is not a development plan as such but a listing of the available opportunities, the constraints, and suggestions for necessary developments needed to maximize the recreation opportunities.

Southern Indian Lake has a tendency to be treacherous. This is mainly due to its size and the large open expanses of water, combined with the many reefs and shoals. Winds spring seemingly out of nowhere and eight to ten foot waves are quite common; these can last for a few hours or a couple of days halting movement on the lake except for the large steel hulled fishboats. Even minor rough water, while not hindering travel to a great degree, hides rocks and camouflages reefs which in calm water would be visible. It is not uncommon for persons using the lake regularly to need three or four new propellers per season and possibly a couple of new lower assemblies for their outboard motors.

A safe channel has been buoyed as far as Missi Falls for the Co-op fish boats and the Manitoba Hydro tugs. This is satisfactory

in good weather, but the buoys have been placed for easy sighting from the bridge of a 42 foot boat, and in even minor swells are almost invisible from a small outboard motor boat.

In the south basin, beach areas or suitable landing areas are very difficult to find. In most instances, an outboard motor must be raised 30 to 40 feet from shore to avoid rocks and then one can still get no closer than 10 feet from the shore. Shore access is somewhat easier in the north basin, but the gentle slope on most beaches means one runs aground sometimes 20 to 30 feet from shore. In calm weather this means a nice wade to the shore, but in rough weather it means a thorough soaking for boat, supplies and occupants. This is also a disadvantage to float-plane landing as passengers and cargo must be offloaded 20 feet from shore.

The main body of the lake is generally too large for recreation use. Aside from fly-in vacations or fishing trips or excursion tours using a large boat comparable to the fishboats, little recreation use is envisaged.

The narrow bays area on the west side is entirely different. This consists of a series of long narrow bays which offer an ideal situation for wilderness boating and camping, fishing, hunting and possible resort operations. The bays are large enough to afford privacy but are sheltered for safe boating except in the very worst weather. Many have small streams or rivers flowing into them and here the fishing is exceptional. Not many trophy fish were taken, but a few jacks were less than eight pounds and were plentiful; pickerel fishing is



PLATE 7

Cool water temperatures limit swimming to the hardy such as these children at South Indian Lake. However, water temperatures are high enough during July and August for swimming. Swimming in the Churchill River is not recommended due to extremely strong currents.



PLATE 8

In the north basin of Southern Indian Lake sand beaches are a regular occurrence. They are too remote for intensive recreation use.



PLATE 9

Remote rapids on streams flowing into Southern Indian Lake provide excellent angling opportunities and outstanding scenery.



PLATE 10

The "narrow bays" area on the northwest shore of Southern Indian Lake provides some of the highest scenic and recreational value in the area.

also good in several of the tributary streams. The only drawback is accessibility. Either a float-plane or a large boat is needed to reach the area, and the rocks and reefs are numerous and uncharted.

Opachuanau Lake is smaller, but is even worse than Southern Indian for hidden rocks and reefs. Clear weather and keen eyes or a thorough knowledge of the lake is necessary for safe boating. The rocks lie just below the surface and because of the water colour are virtually impossible to see unless the water is calm and the sun shining. Tumbled rock shelves sometimes extend 60 to 70 feet out from an island or the mainland, covered by only 8 to 10 inches of water. For this reason it is impossible to hug the shore in rough weather and one must take the full brunt of the waves unless a landing spot can be found.

The Barrington and McBride Rivers offer more shelter for boating and several eskers cut by the rivers have produced sand beaches. The rapids on both rivers are excellent fishing spots. A shore portage on the McBride River gives access to McBride Lake and two portages on the Barrington River give access to Hughes River and a third portage on the Barrington River gives access to Barrington Lake. These areas would make good canoeing areas if a way could be found to bypass the Churchill River and Opachuanau Lake.

People from Leaf Rapids are already venturing as far as South Bay and will eventually try to get to Missi Falls. For the adventure of seeing what is there, they are willing to risk being stranded for a day or two by rough water.

The Southern Indian Lake Co-op Fisheries has expressed some interest in operating a tourist excursion business. This would be geared to a family or the ordinary individual who cannot afford a fly-in lodge for a fishing trip. Small cabins would be built at the mouths of rivers or on bays where the fishing is good and the Co-op fish boats would drop off fishermen at these cabins for two days or a week and pick them up on a return trip to Leaf Rapids. In the fall the cabins could be used for hunting trips. The fees charged for this service would be low enough to interest the average income earner.

The base for such a service already exists as the Co-op operates two 42 foot steel hulled fish boats and a 26 foot launch equipped with an 85 horsepower outboard motor. With this launch, South Indian Lake is only about an hour and a half journey. The basic management also exists in that the entire operation could also be directed by the manager of the Co-op. The main constraint at present is the lack of cabins and the need for the Co-op to run smoothly before another operation could be handled. Since they are getting two or three enquiries daily about such a service, if implemented, it could prove to be an extremely viable operation.

It is assumed that the present road to South Bay would be eventually extended to South Indian Lake. A possible wayside, campground, boat launch facility would be desirable at South Bay to serve tourists coming into South Indian Lake; some wayside type of facility may also be necessary within the settlement. The anticipated recreation

traffic along P.R. 391 is not expected to be large, but any traffic will sorely tax an area that has absolutely no facilities. It is anticipated that as Leaf Rapids grows, an increasing number of its residents will also travel to South Indian Lake either to fish or for a weekend camping trip.

A wayside may also be necessary at a midpoint on this road, say the Vermilion River crossing.

Interpretive areas could be developed at the archaeological sites at the Kame Hills and Sandhill Bay on Southern Indian Lake and at the portage site at Leaf Rapids. The Kame Hills and Sandhill Bay areas could be included as stops on an excursion tour of the lake. The main constraint is that there is nothing to see at either site and the visitation rate would have to be quite large to warrant any expenditure on reconstruction at two such inaccessible spots.

The Leaf Rapids portage site, if significant, could be protected and developed as a historic site. It could become the focal point for a local park for the town of Leaf Rapids. As a historic site or interpretive area, access could be limited to footpaths or boats. This park could encompass the inlet that extends back into town and the peninsular area. A hiking trail has already been cut for about one-half the length of the peninsula and the portage area is heavily used for picnicking. The creation of an archaeological interpretive facility at this site plus picnic tables, fire pits, a hiking or nature trail system the length of the peninsula, an area of the inlet devoted to non-motorized boats and the inclusion of a toboggan and



PLATE 11

A comprehensive local park master plan should be drawn up for this inlet at Leaf Rapids already used by boaters and other recreationists.

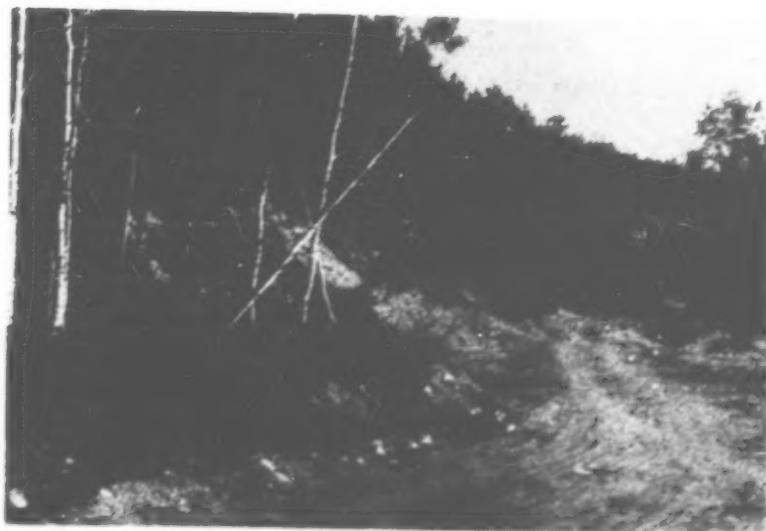


PLATE 12

Sandy soil and bedrock outcrop surround the inlet. The unplanned road emphasizes the need for a comprehensive master plan.

skihill area at the far end of the inlet would make a superior type of local recreation park.

The docking area at the bridge could be improved to the status of a marina with adequate boat docks and an attendant. A food concession could be located in conjunction with the marina; sanitary facilities and a small picnic area could also be added.

6.7 THE HYDRO PROPOSAL

Manitoba Hydro will divert the Churchill River into the Nelson River. This will be accomplished by damming the Churchill River at its outflow from Southern Indian Lake, Missi Falls, and diverting the flow via a diversion channel from South Bay on Southern Indian Lake into the Rat-Burntwood Rivers system and eventually into the Nelson River at Split Lake. To take advantage of this flow for power purposes, a power dam will be constructed on the Rat River just below Notigi Lake. The forebay for this power project will raise the level of Southern Indian Lake some 10 feet, Opachuanau Lake some 10 feet, and the Churchill River to Granville Lake some 6 to 8 feet; similar backup will be experienced in the Barrington and McBride rivers.

The license received from the Province of Manitoba will permit Hydro "to divert not more than 30,000 cfs. of water from the Churchill into the Nelson River. A minimum of 500 cfs. must be released from Missi Falls control structure during open water periods and a minimum of 1,500 cfs. during the ice covered period".¹

¹ Manitoba Hydro News Release, January 25, 1973.

As a result, in the Southern Indian Lake area including High Rock, Granville and Opachuanau Lakes, approximately 211.7 square miles will be flooded or a total of 135,488 acres.² The result of this flooding is the basis for this report.

6.8 CHANGES IN THE RESOURCE BASE

Flooding in the southern area of the lake and on the Churchill River should not be too severe due to the bedrock shore and the steepness of the backshore. Most damage will be done in some bays which have tributary streams or are backed by marsh. Far greater and more extensive flooding will take place north of the Sandhill Bay area where the shoreline is lower and composed of clay and sand backed by muskeg and black spruce forest.

The rise in the water level could have serious implications for the commercial fishery. Whitefish spawning beds will be destroyed and increased siltation due to erosion could cover new or existing shoals and kill the eggs. The increase in water level will cover present pickerel spawning areas at rapids on the mouths of the Barrington, Kakvaskitchewan and Muskewesi Rivers, but fish will travel upstream to the next suitable spawning bed.

The sport fishery will most likely not be affected. The drowned timber, flooded lowlands and submerged snags should make excellent spawning areas for jackfish, thus creating a population explosion. This increase may last for five years or longer. The flooded shoreline and drowned timber while aesthetically unpleasant does not deter

² R. H. Lamont, Chief Forest Inventory, Man. Dept. of Mines, Resources & Environmental Management, December 18, 1972.

the sport fisherman as long as he can catch both large fish and a large number of fish.

The flooding of shore marsh areas and riverine marsh areas will reduce the summer habitat for moose as well as beaver and muskrat throughout the year.

The take of beaver and muskrat may decline if fluctuations in water levels are large, especially in the winter. Decreased land area means a decreased number of furbearers. However, low level increases and small drawdowns will not seriously alter the present conditions.

At present there is no evidence of thermal stratification in Southern Indian Lake but with changes in flow pattern, and the greater depth of the central part of the lake, thermal stratification may develop and a deep cool layer, the hypolimnion,¹ may be formed. This hypolimnion is vital to the survival of lake trout and therefore, if it develops, a lake trout commercial and sport fishery may be developed.

With an increase in water level presently exposed reefs and rock islands will become submerged creating potential new hazards for boaters. Greatly increased numbers of floating and submerged logs will also increase the hazards to boaters.

The raised water levels on the Churchill River, by eliminating stretches of fast water and increasing the depth in shallow areas, may make navigation easier.

¹ Welch, et al

Possible Changes in the Natural Resources of Southern Indian Lake as a Result of the Churchill River Diversion. Winnipeg. November 1966. p.10.

Access to the area via the Leaf Rapids-Ruttan Lake-South Bay road and possibly the barge landing on the Barrington River will draw visitors travelling P.R. 391 as well as residents of Thompson, Leaf Rapids and Lynn Lake. An increase in the hunting and sport fishing activities could make a guiding-outfitting operation feasible. The Northland Inn concept may be feasible using South Indian Lake as an outcamp. This could provide a return of any income lost from commercial fishing or trapping or provide jobs for those already on social assistance.

Of all presently recorded archaeological sites in the study area, 92% will be inundated by the flood waters. Only a small minority of these sites will be excavated prior to flooding, if work continues at its present rate.

6.9 MASTER PLAN FOR OUTDOOR RECREATION IN THE STUDY AREA WITH HYDRO DEVELOPMENT

With the completion of the Manitoba Hydro project, Southern Indian Lake and Opachuanau Lake will be raised approximately 10 feet and the Churchill River about 6 to 8 feet.

If this rise in water levels does no appreciable damage to the commercial fishing industry, aids navigation rather than hinders it, does not flood the narrow bay area too severely and increases the sport fishing potential, then the overall recreational capability of the area should not be seriously affected.

The lake is still too large and treacherous for recreational family boating although South Bay and the narrow bays area could be used for this purpose.

The narrow bay area is also an excellent location for a commercial fly-in lodge operation if the sport fishing capability is increased. The average sport fisherman, as noted, is unconcerned with flooded timber if he can catch large fish or large numbers of fish. This area due to its sheltered nature could also be used for wilderness canoeing and camping.

The Northland Inn concept could be applied using South Indian Lake as an outcamp supplying guides and outfitting services for wilderness canoe trips, fishing and hunting trips.

The Co-op fishery boat could also carry fishermen and hunters to cabins along the system for varying amounts of time, picking them up on a return trip.

The McBride and Barrington River areas would still provide opportunities for boating, fishing, swimming and camping and access may be improved to McBride and Barrington Lakes. The construction of a barge landing on the Barrington River will make road access possible and a wayside picnic area may be necessary here.

Improved navigation on the Churchill River will result in more people from Leaf Rapids using the area. Therefore, a suitable number of boat landing areas must be cleared along the shoreline.

The road into South Bay, the barge landing at this point and the eventual extension of the road to South Indian Lake will necessitate the provision of facilities. A wayside picnic area with sanitary facilities will be needed at South Indian Lake; a campground, picnic area and boat launch will be necessary at South Bay. This latter

facility will give vacationers access not only to South Bay, Swan Bay and Southern Indian Lake, but the Rat River system via the diversion channel. Waysides may also be needed along the road where it crosses likely fishing streams such as the Vermilion River.

The concept of a local park using the inlet and peninsula area at Leaf Rapids would still be feasible depending upon the water rise; it could still be centered on an interpretive area or historic site at the portage area. The rise in water levels could make the park more attractive by making the inlet deeper, creating some small beaches and possibly an island which could be joined to the rest of the complex by a rustic bridge.

The bridge marina facility would be even more in demand if increased water levels improve boating on the Churchill River both above and below Leaf Rapids.

6.10 FUTURE POSSIBILITIES

Southern Indian Lake, as noted, is too large and inaccessible to be used for intensive recreational use. If the lake was close to a major population centre, and was readily accessible by automobile, it would in all likelihood be used on the same scale as Lake Winnipeg. However, Southern Indian Lake has more drawbacks to this type of use than does Lake Winnipeg.

Much of the shoreline is unsuited to cottage development, and those areas that are suited are widely scattered and may only support five or ten cottages. Any development would require the construction of many miles of access roads through difficult terrain. Beach areas

are generally backed by muskeg, burned over areas or scrub bush of stunted black spruce, making any backshore development exceedingly doubtful.

A road extension from P.R. 391 along the west shore would open up many additional recreation areas as it passed small lakes in the region such as Barlow and McGrath. No road would, however, be built solely for recreation purposes. The return would not be large enough to warrant this immense expenditure for a single purpose. Such a road might be built if there were important resource finds in the area north of Southern Indian Lake or if a Provincial or National Park was created in the Big Sand Lake area to preserve the excellent examples of eskers and glacial topography in the region.

A limited number of access roads to such areas as the Kame Hills, Poplar Narrows and narrow bays areas could make excellent use of the shoreline for recreation activities of swimming, boating and camping.

With the continued growth of Leaf Rapids and the demand for outdoor water-oriented recreation increasing yearly, access roads from the South Indian Lake road may be necessary in the next 20 years to the Churchill River, the southeast shore of Opachuanau Lake and the south shore of Southern Indian Lake to serve not only tourist traffic along P.R. 391 but residents of Leaf Rapids travelling for the weekend.

7. CONCLUSIONS

7.1

Southern Indian Lake and Opachuanau Lake and the associated shorelines are not suited to National or Provincial Park designation.

7.2

Archaeological finds in the Kame Hills indicate that the site holds a significant opportunity to interpret the Laurel Pre-history of Manitoba.

7.3

The increased water level will flood the archaeologically rich areas of the Kame Hills and destroy the opportunity to interpret Manitoba's pre-history.

7.4

Flooding as a result of the diversion project will result in a general degradation of scenic quality and thus recreation potential due to flooded shoreline vegetation and clay bank slumpage.

7.5

Degradation of scenic quality, thus recreation potential, will be less in areas of eskers where beaches should reform quickly (two years); in areas of high rock shorelines; or in areas having a thin (four inches) soil mantle where soil and thus vegetation will quickly be washed away.

7.6

Shoreline accessibility will be impaired by standing flooded timber after regulation, resulting in a decrease of recreation potential.

7.7

Construction of control structures over Missi Falls and Missi Rapids and increasing the water level to cover rapids at the mouths of rivers flowing into Southern Indian Lake will result in a permanent loss of these specific scenic areas. The 6 foot drop at Leaf Rapids on the Churchill River will be reduced by as much as 4 feet, thus reducing the scenic value of this accessible area.

7.8

Regulation will result in the increased water depth and thus the increased recreation capability for swimming and beach activities in the inlet of the Churchill River immediately downstream from the rapids and adjacent to the east side of the industrial area of Leaf Rapids townsite.

7.9

An opportunity exists to enhance the increased recreation capability of the inlet adjacent to Leaf Rapids townsite by clearing grubbing and burning vegetation to the high water plus two foot contour level prior to regulation.

7.10

An opportunity exists to fulfill some of the present and future recreational requirements of Leaf Rapids by commissioning a park master plan for the peninsula, inlet, and draw area running from the immediate east side of Leaf Rapids townsite north to the Churchill River. Such a master plan would likely recommend relocation of the town sewage outlet.

7.11

The channel of the Churchill River from Leaf Rapids (rapids) to Opachuanau Lake and from Barrington River Rapids to Opachuanau Lake are suited to power boating by pleasure craft of any size.

7.12

Southern Indian and Opachuanau Lakes are quite open and become very rough in storms and strong winds. The size of the waves, the presence of numerous hidden shoals and rocks makes these areas unsuited to small pleasure craft, especially those operated by unskilled operators or those unfamiliar with the lakes. As well, landing areas are difficult to find and offshore shoals make travel close to shore, especially in storms, quite hazardous.

7.13

Safety problems on Southern Indian Lake and Opachuanau Lake will be increased with flooding due to increased occurrence of dead heads, an inaccessible shoreline and newly created rock shoals.

7.14

Safety measures such as landing areas and harbours of refuge will be required along the shoreline of the areas affected by regulation.

7.15

Presently the best opportunity for shore canoe tripping is to take the route downstream on the Churchill River between Leaf Rapids and Opachuanau Lake and then upstream in any of the tributaries to a point of insection with P.R. 391 north of Leaf Rapids or the Ruttan Lake-South Bay Road.

7.16

The quality of the above mentioned recreational experience will be reduced considerably if the timber to be flooded along these shorelines is not cleared.

7.17

Sport fishing in the study area has proven potential for trophy northern pike equal to or greater than in Reed Lake, the major trophy northern pike lake in northern Manitoba. As well, walleye are plentiful. This situation is expected to continue the same or to improve following regulation.

7.18

The increased accessibility created by the diversion project road to South Bay and the extension of P.R. 391 to Lynn Lake will enable this sport fishing potential to be more fully realized.

7.19

A potential sport hunting industry based on at least 100 animals per year and outside hunters, is not being realized due to remoteness, lack of promotion, and the size of the lake. Combining food, lodging, guiding and license fees at \$500.00 per moose, this represents a potential \$50,000.00 to the area.

7.20

Even though new roads have been built, as a result of the flooding the above mentioned unrealized potential will continue since habitat shoreline will be made inaccessible to hunters.

7.21

At present local hunting for meat is the only hunting pressure. Estimates indicate that the residents of South Indian Lake take approximately $1/3$ moose or caribou per year per family, or a total of approximately 30 animals with a value of fresh meat of \$15,000. Some animals are also taken by Leaf Rapids residents. Flooding will make even this meagre harvest unavailable.

7.22

Waterfowl populations are limited and would provide only minimal attraction. This type of hunting could be a local attraction for residents of Leaf Rapids but has no commercial value.

7.23

Camping on a primitive basis is possible over most of the lake; the only problem is that of access since a fairly large boat and some knowledge of the lake is necessary. It is very easy to become turned around and lost in just a few minutes. With the completion of the road to South Bay and eventually South Indian Lake, a campground will be required at the end of the road.

7.24

Beach areas until the region north of Long Point are very few and far between. The majority of the beaches south of Long Point are gravel or cobble over clay. The two or three sand beaches are small and are most often fronted with a zone of weeds offshore, making the usable water area very narrow.

The water is generally cool but does approach comfortable temperatures for swimming and bathing during late July and early August. A fine sand beach exists on the Barrington River, two miles downstream from the barge landing. Several others exist on the Churchill River six miles upstream from Opachuanau Lake. These areas are accessible only by water. These esker-formed beaches should reform quickly following flooding. With minor pre-flood improvements, the increased water level will provide swimming areas in the inlet adjacent to Leaf Rapids.

7.25

In sheltered, shoal and rock free areas where boating is possible, water skiing is also possible. Wet suits would overcome the problem of cold water in the early and late months and wherever the boat dock or launch was provided, water skiing could be pursued.

7.26

Snowmobile trails and trips are possible, but use of the river and outlet area of Opachuanau Lake should be discouraged. The fast water areas do not freeze and would present hazards to anyone not familiar with this fact. The same cabins used for summer fishing trips could be equipped as stops on a snowmobile trail system. Disadvantages to this would be the finicky nature of snowmobiles and the inability of most operators to make even the most minor repairs or adjustments to their machines. However, since most snowmobilers, like most boaters, will try anything without thinking of the consequences, some trail system with shelters should be established to protect them from themselves.

7.27

There are no areas high enough and with the necessary length of slope to be used for downhill skiing. The quality of the available experience would not be great enough to attract much use to make the capital outlay feasible. Minor ski facilities at Leaf Rapids townsite provide extra incentive to plan a local park in the previously recommended area adjacent to the town.

7.28

The narrow bay area ($56^{\circ} 50' N$ to $57^{\circ} 15' N$ and $99^{\circ} 0' W$ to $99^{\circ} 30' W$) on the west shore of Southern Indian Lake is suitable for a commercial lodge operation.

7.29

The infrastructure of the Southern Indian Lake Fisheries Co-op could easily be utilized to provide reasonably priced fishing excursions on Opachuanau Lake and Southern Indian Lake.

7.30

This opportunity could be threatened by the flooding if adequate boat landing areas are not cleared and some restoration of aesthetic quality by pre-clearing is not done at the mouths and to the limit of flooding of tributaries flowing into the Churchill River to Opachuanau Lake, Opachuanau Lake and Southern Indian Lake.

7.31

A substantial boost to the local economy and a favorable climate for investment in accommodation and service centre facilities will be created as a result of the sport fishing potential being more fully realized. In fact, one will complement the other.

7.32

Greatest recreational use will occur in the following areas:

- the Churchill River to Opachuanau Lake;
- the Barrington River to Opachuanau Lake;
- the tributary river flowing from 8 miles north of Leaf Rapids into the Churchill River;
- Opachuanau Lake;
- the South Indian Lake settlement and environs;
- the mouths of tributary rivers flowing into the system, and
- if it became accessible, the narrow bays area.

7.33

Any attempts at pre-flood timber clearing to ameliorate losses to recreational capability would be most advantageously directed to the above listed areas in the priority designated on the attached recommendation map.

7.34

Considering the expected requirements of recreation land and water; and bearing in mind the importance of recreation and tourism to the economy of Manitoba; the recommendations made in that section merit implementation.

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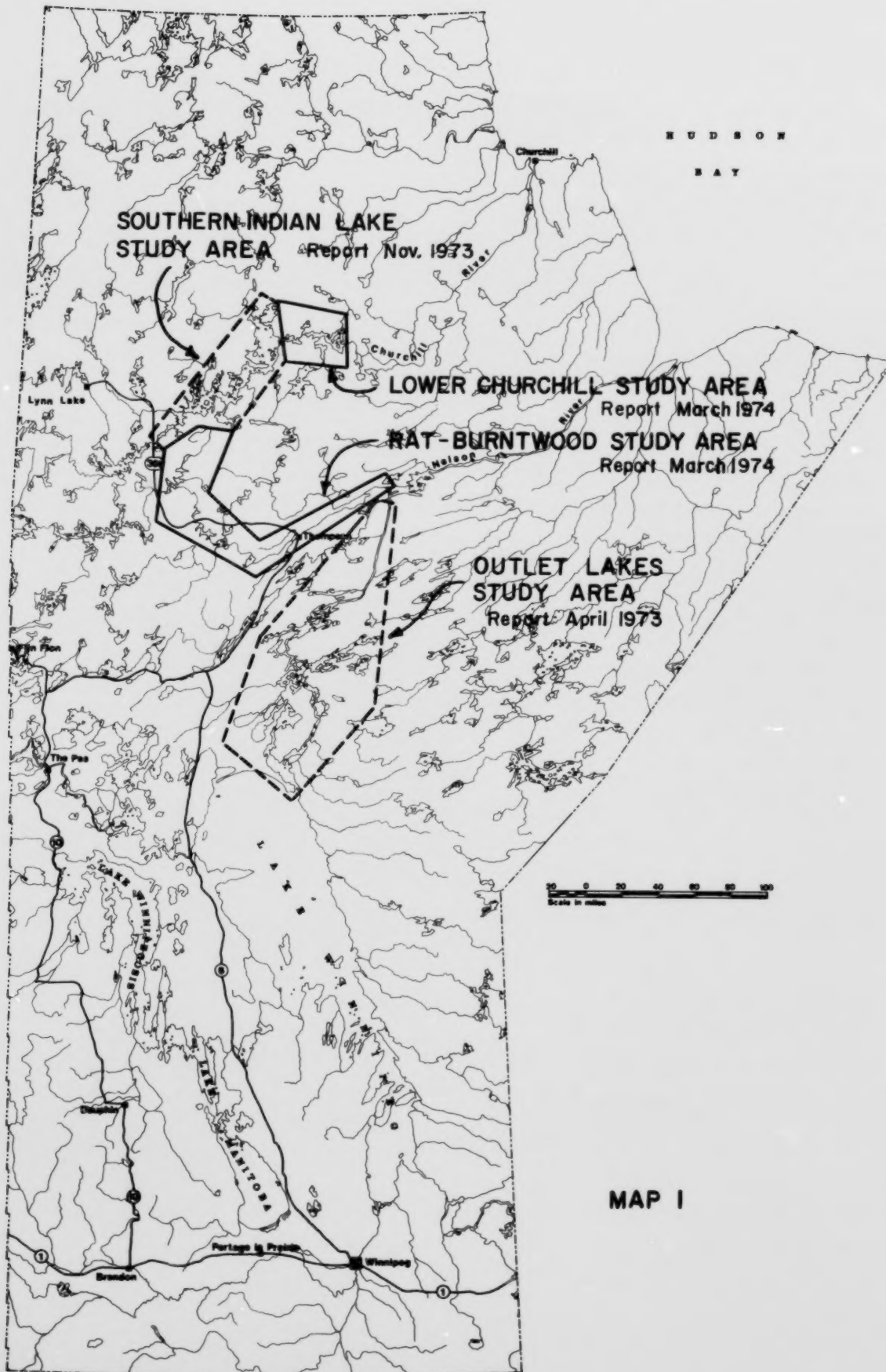
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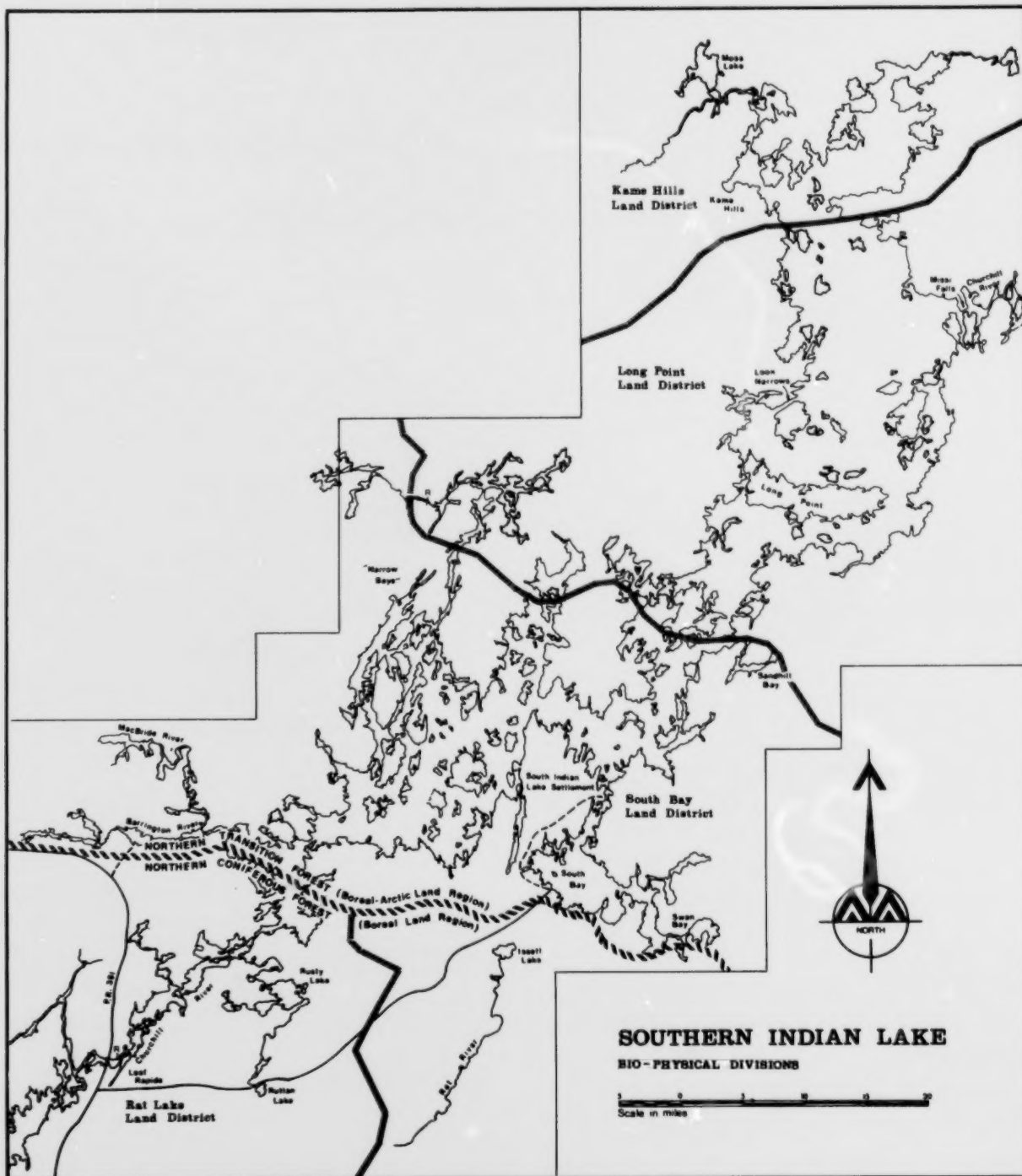
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MAP I



SOUTHERN INDIAN LAKE

RECOMMENDATIONS

I Complete shoreline clearing and grubbing.

II, III, IV, V, VI, VII. Slash, pile and burn to flood level plus two feet in order of priority.

x Landing sites. Position approximate depending on local conditions and recommendations from fishermen.

● Boat launch

⊞ Local Park

▽ Dam sites

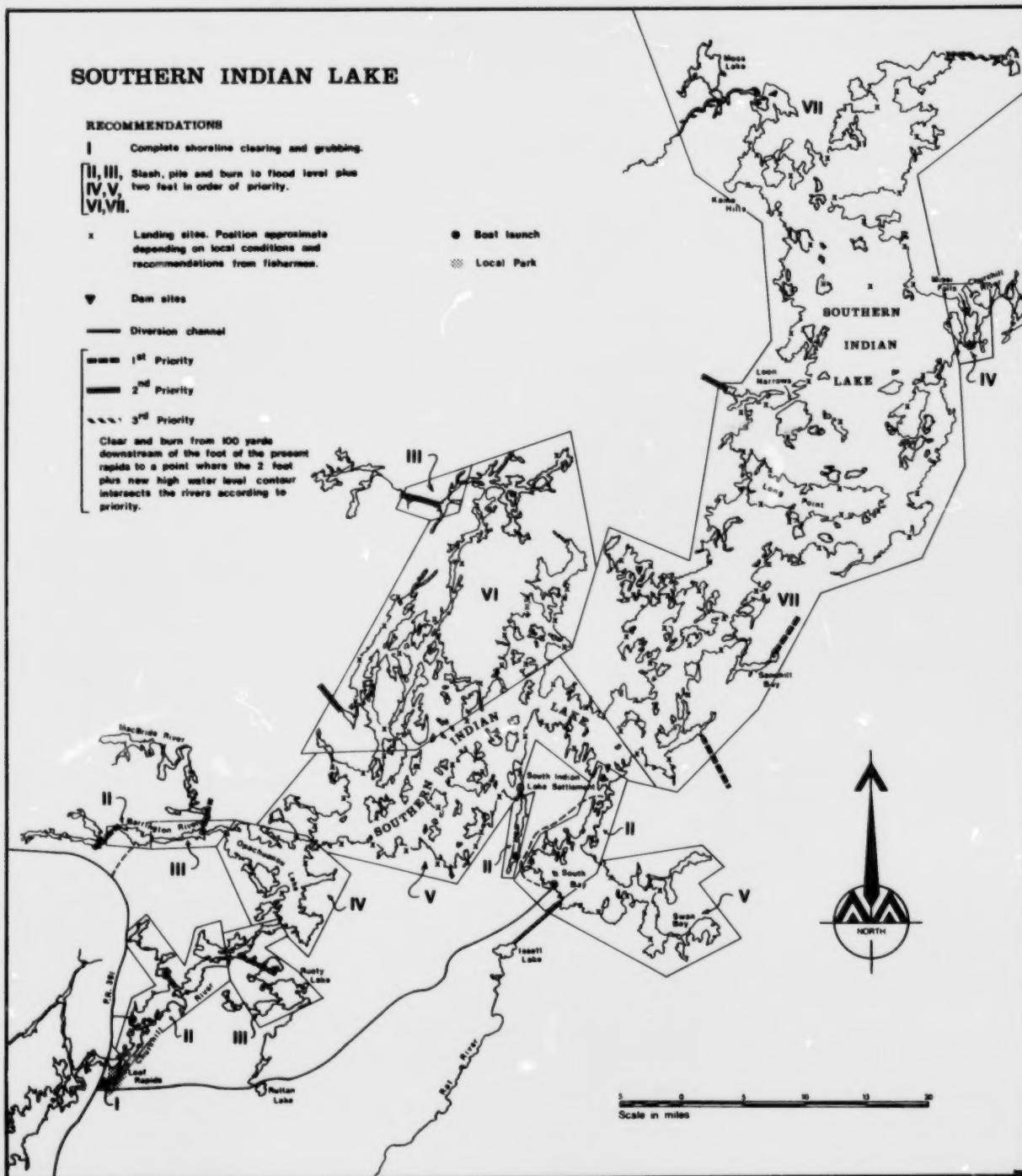
— Diversion channel

▤ 1st Priority

▥ 2nd Priority

▧ 3rd Priority

Clear and burn from 100 yards downstream of the foot of the present rapids to a point where the 2 foot plus new high water level contour intersects the rivers according to priority.



APPENDIX 7 - E
RECREATION ASSESSMENT OF THE
LOWER CHURCHILL RIVER

RECREATION ASSESSMENT
OF THE
LOWER CHURCHILL RIVER

by

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Parks Branch
Manitoba Department of Tourism, Recreation and Cultural Affairs
Winnipeg, Manitoba
April, 1974

for

THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD

SPECIAL NOTE

THE CONCLUSIONS AND RECOMMENDATIONS CONTAINED IN THIS APPENDIX ARE THOSE OF THE AUTHOR(S) AND ARE NOT NECESSARILY THE SAME AS THE CONCLUSIONS AND RECOMMENDATIONS OF THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD AS EXPRESSED IN THE SUMMARY REPORT AND THE TECHNICAL REPORT.

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1. RECOMMENDATIONS

- 1.1 Thorough ecological studies should be carried out along the Lower Churchill River to fully understand the consequences of reduced flows on the biotic communities along its banks.
- 1.2 The feasibility of releasing greater flows through the Missi Falls control structure to preserve wildlife habitat and reduce the damage to the ecology should be examined.
- 1.3 An assessment by the Parks Branch of the recreational use of the lower Churchill River near the town of Churchill should be carried out to determine the effects of reduced flows on this use.
- 1.4 Manitoba Hydro should contact the Parks Branch of the Manitoba Government to consult with them in developing new cottage areas around Churchill, should the reduced flows and levels make the present areas unsuitable for use.
- 1.5 Manitoba Hydro should examine the feasibility of putting dams on some of the tributaries and the outlet of Partridge Breast and Northern Indian Lakes to pond water to be used to regulate the lakes and the river at a more natural level at times of low flow.

2. INTRODUCTION

This report is one of a series prepared by the Recreation Sector of the Lake Winnipeg, Churchill and Nelson Rivers Study. These reports were required to assess the effect of water regime changes on the recreational potential of those areas affected by the Manitoba Hydro proposal to divert the flow of the Churchill River through the Rat-Burntwood Rivers system into the Nelson River at Split Lake. Comprehensive recreation reports have been submitted on Southern Indian Lake, the Rat-Burntwood Diversion Route and the Outlet Lakes. In this report, the Recreation Sector was required to assess the effect of water regime changes on the recreation potential of the Lower Churchill River, from Missi Falls to Fidler Lake.

Due to the extreme isolation of the area, limited field time and the general lack of information on the area, this report is only a brief assessment of the potential and should be complemented by a more complete comprehensive study which would fully assess the effect of severely reduced flows. This brief assessment was carried out during the summer of 1973 and is presented in this report.

3. HYDRO PROPOSAL

In June, 1975 the north channel at Missi Falls on Southern Indian Lake will be closed to allow the ponding of water in Southern Indian Lake to raise the level to elevation 847 feet. A spillway channel will be constructed through the southern end of the island, separating the two original channels. The new channel will be approximately 2,000 feet long and 315 feet in width. Flow in the channel will be regulated by six lift gates.

The rapids will be eliminated and the reduced outflow will leave the lake through the spillway. The mean monthly average annual outflow will be reduced from 35,692 c.f.s. to 8,857 c.f.s. With the diversion scheme, however, mean monthly outflows could be as low as 500 c.f.s. and as high as 73,787 c.f.s. In general, flows will be much lower than recorded historic flows.

Under regulation, the yearly average discharge of the Churchill River below Missi Falls will be reduced approximately 75 per cent. However, under extreme conditions the monthly flows could be as little as 4% of historic or as much as the highest historic flows. There is high probability of severe fluctuations in flow during summer months. Winter flow fluctuations will be more moderate with a general decrease in discharge from October at 8,500 c.f.s. to March at 1,500 c.f.s.



PLATE 1

Churchill River below Missi Rapids after damming of south channel.

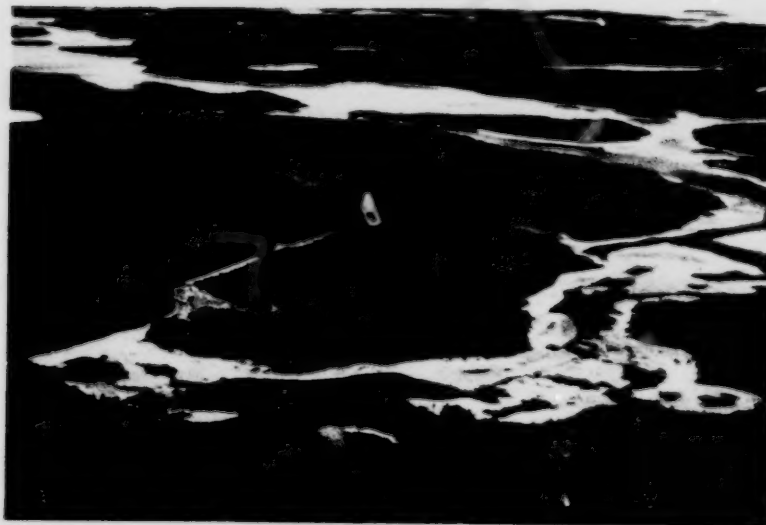


PLATE 2

Churchill River below Missi Rapids showing exposed shoreline.

4. PRESENT RECREATIONAL USE

Present use of the Lower Churchill River for recreation is limited to the sixty miles upstream from the town of Churchill. There are three cottage areas on or near the river. One is a subdivision near the end of the road running from Churchill to the water pipeline and pumphouse, the second is Camp Nanuk, seven miles east of Fort Churchill, and the third consists of scattered cottages upstream along the Churchill River.

The first area contains thirteen cottages and lots are being surveyed for eighteen more, although this is not expected to cover local demand. The land is leased yearly from Manitoba Surveys, Mapping and Lands Branch. The Churchill River is within walking distance and people keep their boats in a marina at Goose Creek.

Camp Nanuk is located on a lake and is owned by the National Research Council Churchill Research Range.

The third area upstream consists of twenty cottages within five to ten miles of Goose Creek. They are accessible only by boat and the residents are dependent upon the river for their diversion.¹

Grayling fishing at Goose Creek is excellent, and pike, speckled trout and pickerel are caught in the Churchill River and its tributaries especially the Deer River. Winter sport fishing for pike is carried out around the mouth of the Herriot River.

The river is used extensively in the fall for goose and duck hunting and some moose are taken. Winter snowmobiling is also popular.

The Churchill River below Missi Falls, due to its inaccessibility and the dangers of the route attracts only one or two canoe parties per year. Sport fishing is limited to these parties and should not increase in the foreseeable future.

¹Personal Communication Socio-Economic Impact Study

5. EFFECTS OF SEVERELY REDUCED FLOWS

Severe ecological consequences will result as the chain lakes along the system are very shallow and pan shaped. The average depth of these lakes is only 5 meters (17 feet) and the drop in level from November to January will be Partridge Breast Lake, 9 feet; Northern Indian Lake, 8 feet; Fidler Lake, 9 feet; and Billard Lake, 7 feet. The resulting exposed shoreline will be Partridge Breast Lake 1,600 acres; Northern Indian Lake 15,000 acres; Fidler Lake 6,500 acres; and Billard Lake 2,000 acres.¹ What could result is a series of small pools connected by trickles of water. This will have severe ecological consequences for shoreline biotic communities which will be altered or destroyed due to lower water levels.

With lower water levels and reduced flows, the ice regime of the river and lakes will change. The scouring action of the ice maintained a stretch of shoreline over 60 miles in length free of major vegetation, and supporting marsh grasses. This area is a major nesting area for Canada geese and ducks. There will be a loss of the scouring action which will reduce the habitat areas available for nesting. Without the ice scouring, instead of marsh grasses forming the shore edge, the willow-alder commune could succeed. This would make the area unsuitable for marginal waterfowl habitat. The direct effect of this would be the

¹R.W. Newbury: The Effects of Diversion on the Winter Regime of the Abandoned Lower Churchill River. Water Resources Branch, Department of Mines and Natural Resources, Winnipeg, 1970, p. 17.



PLATE 3

Partridge Breast Lake pre-diversion condition.



PLATE 4

Churchill River showing willow-alder foreshore, black spruce backshore pre-diversion.



PLATE 5

Partridge Breast Lake after damming
south channel Missi Rapids.



PLATE 6

Exposed shoreline Northern Indian Lake.



PLATE 7

Fidler Lake exposed shoreline.

reduction of the productivity of the area and a reduction of the number of birds available to southern hunters in the fall flights. In addition, the minimum 500 c.f.s. flow during the summer months could be insufficient even with tributary inflow, to maintain habitat of suitable quality.

Commercial fishing on the lakes presently produces about 65,000 pounds per year, primarily whitefish. Due to the reduction in flows and lake area, the overall fishery potential along this system could be reduced 50 to 75 per cent and could make the existing fishery uneconomic.¹

In terms of recreation use, the lower flows could make the river safer for canoeing; however, the majesty and grandeur of a wild untamed northern river would be gone. The route in its pre-diversion state was dangerous to travel with over fifty sets of rapids and falls between Missi Falls and the town of Churchill. Portages around these rapids and falls are unmarked or non-existent. Present river currents are so strong that even small sets of rapids are dangerous to run. The rapids in many areas are between sheer rock walls 50 to 100 feet in height with no portage. A party must either turn back, climb the walls or be foolhardy and try to shoot the rapids. The risks are just too great for this to become a highly travelled canoe route. It is not even the traditional route to Hudson Bay and Churchill. The traditional route is via Moss Lake at the north end of Southern Indian Lake to Little Sand Lake, Chipewyan Lake and the Seal River to Hudson Bay. The inaccessibility of the area and the dangers involved in any trip down the Churchill River will continue to severely limit its use. Maximum use may be one or two parties per year.

¹ Overview report submitted April 4, 1973 from Honourable Jack Davis, Minister, Environment Canada to Honourable Sidney Green, Minister, Mines, Resources and Environmental Management.

In relation to the aesthetics of the region, although the area is relatively inaccessible and severely limited in use, it is necessary to make suggestions in an effort to mitigate the effects of the diversion. Although it may never actually be seen by the great majority of Manitobans or Canadians, through press coverage and controversy they know it is there. In this age when the value of wilderness and natural areas is becoming appreciated, it offends the sensibilities of people to see the destruction of pristine lakes by having them drained of water and surrounded by unsightly mud flats and the destruction of a spectacular wild river by drastically reducing the flow for single purpose enterprises.

The great decrease in flows below Missi Falls will expose large expanses of mud flats. With the fluctuating water levels, the flats will alternately freeze and thaw, crack, and be subject to erosion from higher summer levels. These mudflats will also make shore access difficult for both humans and animals. Exposing aquatic plants to freezing could kill the roots, destroying the plant.

Lower water levels could have an adverse effect on the willow-alder community. Preferring damp areas, they may die off, leaving a band of dead vegetation along the former shoreline. The destruction of the marshes is a certainty and it remains to be seen if the flow is large enough to prevent the entire area from becoming one big slough through the processes of succession.

6. FUTURE POTENTIAL

Local tourism in the Churchill area has been limited due to a lack of facilities rather than a low potential. The demand exists for expanding and providing services to the existing cottage areas. The Northland Inn concept of central tourist lodges in major northern population centres with remote outcamps appears feasible for Churchill. In the case of Churchill, locations for outcamps in the Barren Lands, the polar bear denning areas and York Factory appear feasible as part of a "tundra tours" package.¹

The potential also exists for guiding and outfitting canoe parties using the Deer River, goose hunting organized by the local Co-operative, and the development of Fort Prince of Wales and Cape Merry into tourist attractions.²

These attractions plus the expansion of existing facilities to meet tourist demand could lead to the development of the Churchill area into a tourist attraction oriented toward a broader base than simply the Whaling Co-op and the present C.N. train excursion.³

Severely reduced flows, however, could negate this potential by making present cottage areas unattractive, the river and tributaries too

¹Province of Manitoba. Guidelines for the Seventies. Vol. 1 Introduction and Economic Analysis. Winnipeg, March, 1973. p. 109

²Personal Communication Socio-Economic Impact Study.

³Ibid.

shallow for recreational boating and seriously reducing the sport fishing potential.

The Churchill River below Missi Falls will not receive any more use than it presently does. The air strip at Missi Falls may draw in a few (two or three) fishing or hunting parties, but general use would be intermittent and restricted to Hydro employees servicing or checking the equipment at the control structure.

The lower reach of the river to Churchill has been designated in Guidelines for the Seventies as a modified waterway within an ecological reserve which contains extremely sensitive ecosystems largely due to climate. Very little is known about these systems and their fragility and much more research is required before any further development is allowed.

This area is part of the Hudson Bay Lowlands and as such, could receive prime consideration for National Park designation. As yet, the Parks Canada System does not contain a representative example of the Hudson Bay Lowlands. If, however, the reduced flows have a severe effect on the sensitive ecosystems already mentioned, this consideration would be dropped in favour of an area that would not be altered.

7. CONCLUSIONS

7.1 Reduced flows in the Lower Churchill River will disrupt the ecology of the area and alter the natural environment by exposing large areas of shoreline, destroying goose habitat, and removing the ice scouring processes on the banks.

7.2 If reduced flows in the Lower Churchill River severely affect the biotic communities of the Hudson Bay Lowlands' section, this area would no longer be worthy of consideration for a National Park.

7.3 Reduced flows on the Lower Churchill River near the town of Churchill will make the river too shallow for recreational boating.

7.4 Reduced flows will disrupt the only access (boat access) to cottages upstream from the town of Churchill.

7.5 Lower flows could seriously affect the sport fishing potential of Goose Creek, the Deer River and Herriot Creek.

7.6 Reduced flows will destroy goose and duck habitat reducing the numbers available to both northern and southern hunters in the fall flights.

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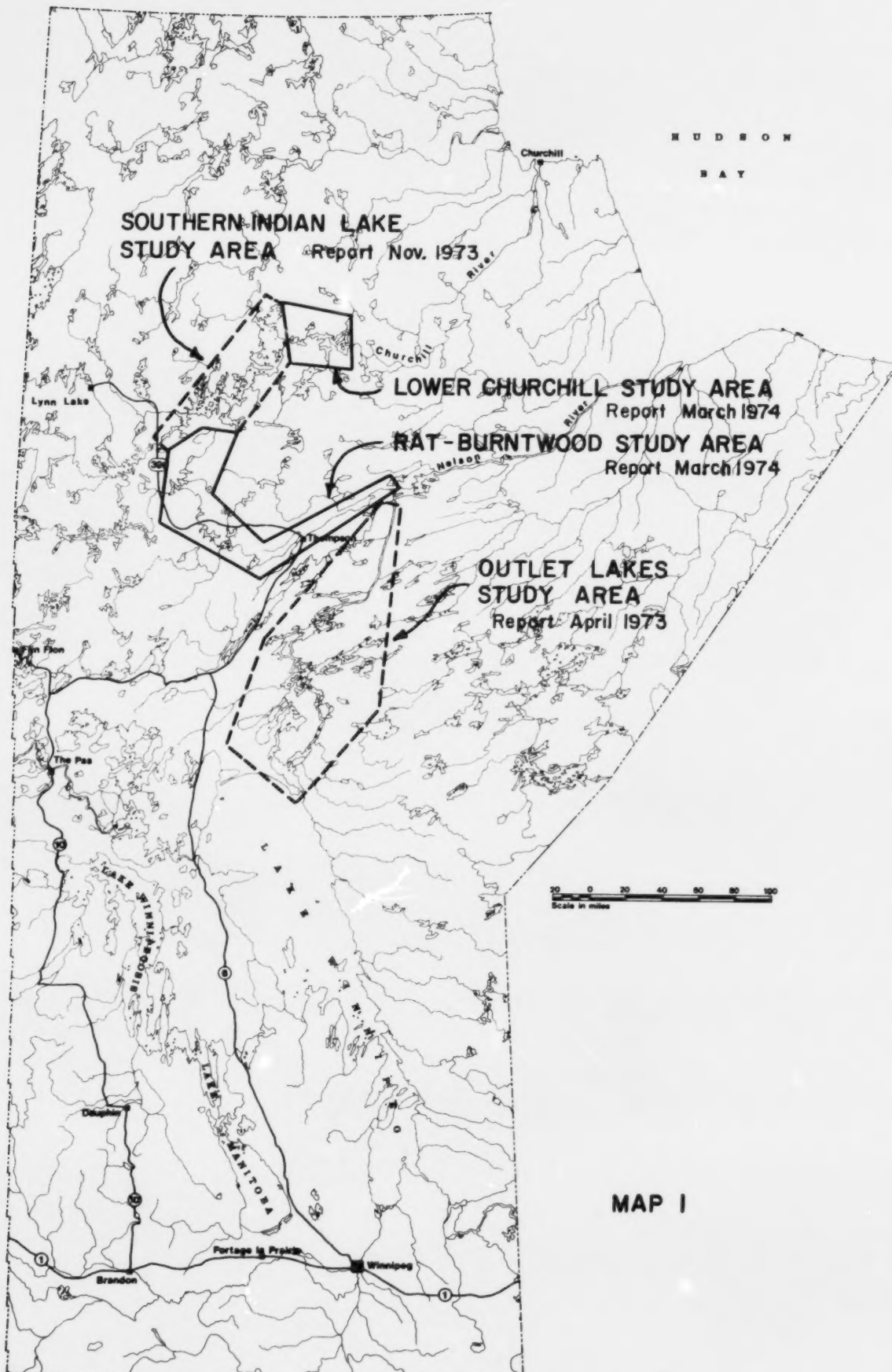
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MAP I

SOUTHERN

INDIAN

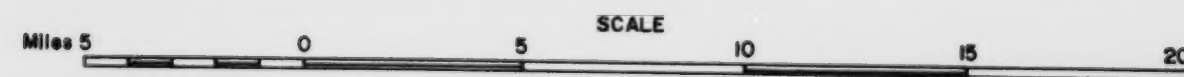
LAKE





LOWER CHURCHILL RIVER

MISSI RAPID TO BILLARD LAKE



APPENDIX 7 - F

AN ASSESSMENT OF THE ARCHAEOLOGICAL RESOURCES
OF THE OUTLET LAKES AREA

AN ASSESSMENT OF
THE ARCHAEOLOGICAL RESOURCES
OF THE OUTLET LAKES AREA

by

E. L. SYMS, M. E. KELLY and O. L. MALLORY
Churchill Diversion Archaeological Project
Winnipeg, Manitoba
March, 1973

for

THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD

SPECIAL NOTE

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ABSTRACT

The Churchill Diversion Archaeological Project fielded a crew of one archaeologist and 3 crewmen to evaluate the archaeological resources of the north end of Kiskittogisu Lake. During the following winter, one archaeologist and assistant assessed the field data, conducted library research on the known archaeological sites, and prepared an evaluation of the archaeological resources and potential loss of these resources.

SUMMARY EVALUATION
OF THE
ARCHAEOLOGICAL RESOURCES
IN THE
OUTLET LAKES SYSTEM

RECOMMENDATIONS

Before reading the recommendations, the following points should be kept in mind:

1. That approximately 82% of Manitoba's 10,000 year old cultural heritage in the Outlet Lakes System is unwritten and/or poorly recorded and in imminent danger of being destroyed.
2. That these archaeological sites have value in the study of human history and adaptability only if they can be investigated in an undisturbed state and that these sites are crucial in understanding seasonal activities of past peoples.
3. That these archaeological sites are part of Manitoba's cultural heritage and that significant numbers of people are becoming increasingly concerned with this aspect of total societal development. The Native ethnic groups eg. Cree, Assiniboine, Chippewyan, and Dakota Sioux, are becoming more concerned about the loss of their own heritage and history, and growing numbers of Euro-Canadian descendants are becoming concerned about the loss of this data for their children and future generations.
4. That the histories and records of human environmental adaptation for one area cannot validly be fulfilled or substituted with investigations even in other adjacent areas eg. the archaeological record at The Pas is different from the archaeological record at the north end of Southern Indian Lake, and that both are different from the archaeological record of the Outlet Lakes System.
5. That the archaeological sites are fragile, non-renewable phenomena that cannot be replaced or reconstructed once they have been destroyed.
6. That the development of the archaeological resources in any area can enrich and enhance the use of that area for all following generations. The area can be enhanced through museum exhibits and dioramas or through tourist look-out stations with illustrated billboards and reconstructed villages for fur trade posts.

The recommendations are of two types. The first category consists of those recommendations which are concerned with immediate short-term problems; the second category deals with broader long-term recommendations.

Short-term Recommendations:

1. In the short time that remains, before the new water regimes go into effect, archaeological research should be conducted along the east channel of the Upper Nelson River. This research would involve one 11-man crew (the smallest effective unit in the Boreal Forest) concentrating upon selected areas where historic sites are known and where major portages are located. Intensive research and test excavations should be conducted in the vicinity of these locations eg. Warren's Landing, (Norway House I, 1812-24), Norway House community (Norway House II and III, 1826-present, one known prehistoric component), and the channel around Sea River Falls.
2. We recommend that clearing and construction at Sea River Falls progress with a minimum destruction of the archaeological record. Possible clearing should be by saw rather than by bulldozer, or during the winter season, until the survey has been completed and sufficient efforts have been made to salvage the necessary data.
3. A trained and experienced archaeologist should be assigned to all major construction activities such as the clearing for and construction of roads. These individuals could assess the magnitude of data loss and conduct salvage work.
4. In conjunction with #3, there be developed a training program to involve construction personnel in the discovery and conservation process of archaeological resources.

Long-Term Recommendations:

1. In terms of broader recommendations, lessons should be learned from the errors of this hydroelectric project. Planning and cost estimates must include sufficient time and funds for adequate archaeological research. In order to allow adequate time for saving the prehistoric and early historic cultural heritages, research should begin as soon as initial plans have been made.

2. All developmental programs should include an adequate budgetary allowance for archaeological research. The Moss-Bennet Bill before the United States Legislature recommends that 1% of all expenditures be set aside for an archaeological salvage of pre-historic and historic materials. A similar program needs to be initiated at both the provincial and federal levels in Canada.
3. Efforts should be made to reconstruct a historic fort and a traditional Native village of the pre-European period. Local Natives should be a part of the consultation, construction, administration, and operational phases to whatever degree is possible.
4. Under present day industrial conditions, the conservation and development of cultural heritage cannot be a part-time or ad hoc undertaking. To avoid the difficulties and inefficiencies caused by having archaeological research tied to major industrial developments it is recommended that a broad based provincial program of archaeological and historical site inventory and research be established. It is further recommended that this program have functional ties to the Department of Education and Native Peoples Groups as well, the Department of Tourism, Recreation and Cultural Affairs, the Universities, Museum Associations, Archaeological and Historical Societies.

II

OBJECTIVES

The initial objectives of this study were: 1) to evaluate the human history and affiliated natural history resources in the Outlet Lakes Area, 2) to assess the effects that the proposed Manitoba Hydro projects might have on these resources, and 3) ultimately to predict how these effects will extend to the province as a whole. Human history resources include the total record of humanity, Indigenous and Euro-Canadian, in the area as represented by pre-historic and historic archaeological sites.

One aspect of total human history is a chronology of cultures that have occupied an area. In order to establish chronological cultural sequences and the times of occupation, it is necessary to have a record of all cultures at any

given time and the duration that each culture occupied the area. This requires excavation of two representative geographical and temporal samples of sites in order to obtain adequate data, such as, specimens of tools, utensils, stages of lithic production, features such as hearths and tipi rings, faunal remains to indicate diets, and samples of organic materials for radiocarbon dating.

Distribution patterns of sites may also indicate seasonal rounds of activities of any particular group at any point in time. The resultant history should consist of a cultural adaptation model illustrating the patterns and processes of ecological adaptations.

Since available historical, ethnographic, and archaeological data indicates that we are dealing with nomadic peoples during the majority of the time involved, i.e. the last 10,000 years, the Outlet Lakes System must be viewed as merely one of several areas which the various peoples may have been utilizing in their annual round of livelihood activities or which they may have been using as a major navigation and communication route. Arthur J. Ray (1971) illustrates a cyclical pattern of Boreal Forest occupants (Early-Historic Cree) moving from the Boreal Forest into the Aspen Parkland during the winter to hunt buffalo, then moving back into the Boreal Forest during the other seasons to utilize the lakes, streams, and forest for their animal, bird, and fish resources. By looking at the archaeological record, we may determine if this is a recent historic pattern or if this pattern was followed 1,000, 2,000, or 5,000 years ago.

The archaeological record of the Outlet Lakes System, to have maximum meaning, must be correlated with the archaeological record on the Rat-Burntwood System, Southern Indian Lake System, and other areas such as the Lake Winnipeg System, the Saskatchewan River System, and the Winnipeg River System which interdigitate to form a nexus of summer water routes and winter ice routes. The record on the Outlet Lakes System is related to other areas such as Ontario and Saskatchewan, and finally to the North American history as a whole.

The most immediate concern, however, is ascertaining actual physical impact of proposed developments by Manitoba Hydro and auxillary construction might have upon the latent archaeological data reservoir of the Outlet Lakes Region. This will largely be couched in negative terms because any disturbance of site matrices, whether by natural or man made causes, is a decrease or depletion of the total data reservoir. While this depletion might not seriously retard the current advance in archaeological knowledge, in the decades to come, as new theories and techniques are advanced, any site loss now will curtail the effectiveness of archaeology to investigate and test hypotheses. In this respect there can be no weighting of site values by antiquity, size of type, recent activities such as Hydro investigations, fishing camps, hunters camps, etc. are archaeological and have utility for future studies of man-land relationships. Consequently, they, in the future, well may have equal value to 10,000 year old Big Game Hunters camps.

Finally, it is necessary to derive alternatives that will reduce the current rate of loss and to produce long-term positive effects for the local northern communities that are to be effected and for Manitobans in general. These alternatives must ameliorate the short term changes as well as generate recommendations for future large scale projects.

III TERMS OF REFERENCE

From the previous discussion of the objectives, it should be apparent that the archaeological project should have an extremely broad base. The limitations of funds and time and the directions recommended by the Study Board produced relatively narrow terms of reference.

The members of C.D.A.P. were asked to concentrate their efforts on the northern part of Kiskittogisu Lake where the projected direct effects to the shoreline due to Hydro development would be greatest. This was also deemed advisable since there was insufficient manpower to systematically investigate the entire shoreline in the time available.

Work was carried out by a single four man survey team who accumulated archaeological data from a stratified random sample of physiographic units along the lake. In addition to the cultural data the group was charged with accumulating site specific data on local geology, vegetation and soils. This latter data is integral to establishing the interplay between past lifeways and past environments.

IV

STUDY AREA

The total area under consideration is the combination of lakes and streams included within the term, "Outlet Lakes System" (see Figure 1). This area includes the east and west channels of the Upper Nelson River from Warren's Landing to, and including, Cross Lake. Playgreen Lake, Little Playgreen Lake, Kiskittogisu Lake, Kiskitto Lake, Pipestone Lake, and the lower part of the Minago River make up the remainder of the study area.

The field research universe in which the archaeological team concentrated their efforts consisted of the shoreline of the north end of Kiskittogisu Lake and the shoreline of the Upper Nelson River from the Jen-Peg control structure south to Kisipachewuk rapids. The shorelines of Kisipachewuk, Metchanais, and Ominawin Rapids and the east and west shores of Kiskittogisu Lake from Kisipachewuk Rapids north to Whiskey Jack Bay and the mouth of Playgreen Lake were included. All islands within this boundary were part of the research universe (Kelly 1972).

Research was confined to areas along the shoreline and immediately behind the shoreline. The variable landscape along the shoreline was divided into a number of map-based topographical units in order to assure that a representative sample of the topographic variability was checked.

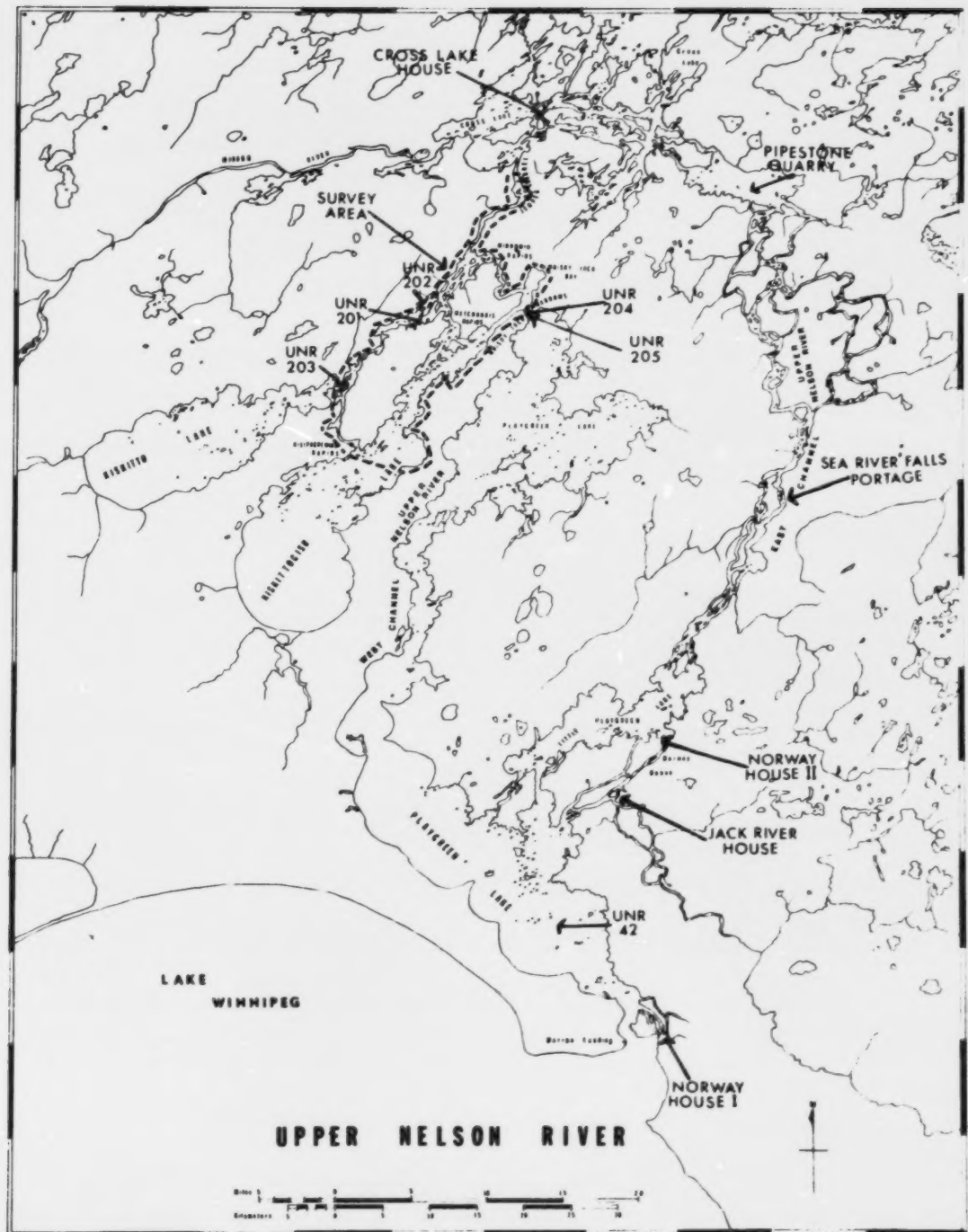


Figure 1: Map of Outlet Lakes System.

V

METHODOLOGY

The field research area was divided into six topographical classes - points, streams, islands, bays, marshes, and beaches. A 20% stratified random sample, 237 of 1,178 units, was chosen and visited. At each unit, local physiography, flora, fauna, and archaeological evidence, if present, were noted. The crews were too small and the number of units to be visited was too large to enable any sub-surface testing to be conducted.

Library research was conducted to ascertain known manifestations of pre-historic and historic sites in the area not covered by the field survey (see Figure 1). This research was primarily concerned with data in the east channel of the Upper Nelson River.

On the basis of the field research and library research, an evaluation of the archaeological resources and the limitations of the evaluation were discussed.

VI

OBSERVATIONS AND CONCLUSIONS

Survey Sample

Only a minute part of the total Outlet Lakes System was covered by the survey. Within this survey sample, a projected sample of 330 activity loci was ascertained. Approximately 30% of these activity loci represent recent exploration activities related to the Nelson River Power Project, and approximately 30% of these loci represent commercial and sports hunting, trapping, fishing, and logging activities throughout the late historic period. No evidence of early

historic fur trade sites nor prehistoric sites were found, but this probably reflects the limitations of the field research due to crew size and time, rather than the complete dearth of prehistoric utilization of the research universe. Several traditional Native trapping and fishing cabin sites, particularly UNR204 and 205, were noted. These sites could give important data on adaptive concepts of people who are bridging the disparity between traditional and industrial lifeways. These sites are in danger of destruction by new water levels eroding away the unconsolidated clay banks upon which they are located.

East Channel Sample

The data is based upon library research. The East Channel was one of the main travel routes in the early historic fur-trade period and during at least some of the preceding prehistoric periods.

There are at least five fur trade posts in the Outlet Lakes System (see Appendix F) and two more are located on attached water bodies. These are Norway House I (1814-24) at Warren's Landing, Norway House II and III (1826-present) at the present community of Norway House, Jack River House (1801-1817), Rossville Post, Cross Lake House, and Sipiwesk House. A number of important geographical spots which warranted comments by early travellers are also known, eg. High Rock, Sugar Falls and Sea River Falls.

The known prehistoric archaeological manifestations indicate habitation sites of two different prehistoric cultures - the Manitoba Phase culture or prehistoric Ojibwa (A.D. 800-1600) and the Selkirk Phase culture (prehistoric Cree) of

about the same period. The Manitoba Phase, which is normally found more to the southeast, is known from two sites. The significance of this culture raises many questions since it has not been located on the Southern Indian Lake System nor on the Rat-Burntwood System.

Other known prehistoric evidence consists of stone quarries on Playgreen and Pipestone Lakes and a pictograph site (stone paintings of religious significance). These special activity sites help to reconstruct the entire round of activities by various prehistoric populations.

TABLE 1
ACTIVITY CLASSIFICATION FOR SURVEY AREA

Sites	Non-Control Sample	Control Sample	Projected Sample
RECENT HISTORIC SITES			
Manitoba Hydro and Affiliated Groups	13	20	100
Commercial and Sports Hunting and Fishing	6	13	65
Commercial Logging and Mining	1	3	15
MISCELLANEOUS	1	26	130
PORTAGES	6	4	20
EARLY HISTORIC SITES	0	0	
PREHISTORIC SITES	0	0	
TOTALS	27	66*	330

* Sample of 66 activity areas comes from 59 different sites; at a few sites there were indications of more than one set of activities.

Total Outlet Lakes System

The negative findings concerning prehistoric archaeological sites on the north end of Kiskittogisu Lake indicates that compared to other sectors of the Nelson River Power Project such as Southern Indian Lake and Rat-Burntwood Diversion route the anticipated archaeological data loss will be relatively lower. This is not to say that in absolute terms the loss will not be substantial. The relative weighting is a simple reflection of the available funds and personnel for conducting industrially stimulated intensive rescue research. The physically impacted area of Kiskittogisu is appreciably less in magnitude than the diversion route and Southern Indian Lake.

Comparison of the intensity of work and findings made by research teams in other sectors of Nelson River Power Project indicate that there is good reason to believe that a substantial number, perhaps several score, of prehistoric sites will be adversely affected. This is particularly true if at any time in the future water levels are raised to a point the entire shoreline of Kiskittogisu Lake or larger areas are brought to a new equilibrium.

If this occurs the problem shifts from the loss of a portion of the shoreline sites to all of the shoreline sites and associated paleo-environmental data and consequently the entire lakeshore interpretative frame of reference.

On the basis of data from elsewhere in the Boreal Forest (Dickson 1972; Hlady 1971; Wright 1968, in press), we can make broad predictive generalizations

about what we might expect to find in the Outlet Lakes System, but these predictive generalizations need to be substantiated or refuted by research since each system appears to have its own unique record. The Outlet Lakes System has probably been occupied for the last 10,000 years, in which time a number of archaeological complexes have been left, eg., Late Paleo-Indian (8,000 B.C. - 4,000 B.C.), Shield Archaic (4,000 B.C. - 700 B.C.), Middle Woodland (700 B.C. - 600 A.D.), Late Woodland (600A.D. - historic period), the Early Historic Period (A.D. 1600 - 1880) and the Late Historic Period (A.D. 1880 - present). Some prehistoric peoples were likely using the area intensively during the spring, summer, and fall (eg. the early historic Cree and Chippewyan) while other groups were using the area mainly as a transportation route (eg. the early historic Assiniboine).

During the Early Historic period, the Outlet Lakes System provided two major transportation routes. One route consisted of Echimamish River, East Channel and lower Playgreen Lake, and the other route consisted of Cross Lake and Minago River. Settlers travelling from York Factory to the Red River settlement used the former route.

The archaeological resources cannot be transplanted nor replaced. Once the sites have been destroyed, their information is lost forever. The new proposed water levels for Kiskittogisu Lake and the fluctuating water regimes for Cross Lake and other water bodies will lead to increased site destruction (see Figure 2). Other destructive elements are construction activities, timber clearing, and increased disturbance of sites by artifact collectors.

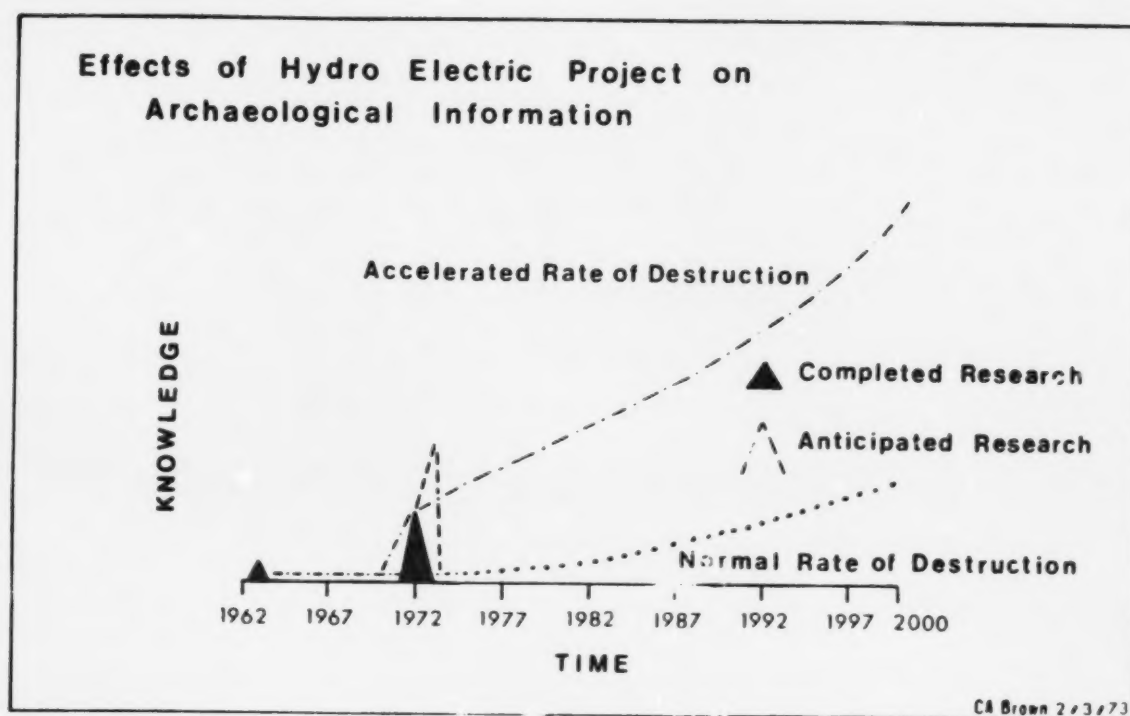


Figure 2: Effects of Hydro Electric Project on Archaeological Information.

Native groups are expressing an interest in their long term cultural heritage, much of which involves archaeological research. The success of the Manitoba Museum of Man and Nature's Rolling Stock Museum and the vocal criticism by various groups concerning the almost total absence of Native heritage in Manitoba textbooks and school courses reflect a new trend in public concern.

The cultural heritage of prehistoric and early historic periods can only be adequately understood if data from all areas are accumulated. The Outlet Lakes System can be one of those contributing areas or it can become a perpetual blank.

The above data indicates there is a long and varied history of human development in northern Manitoba and that the Outlet Lakes undoubtedly had an important role in the complex and dynamic adaptive processes. For this cultural

heritage information and materials to become an integral part of a full and equitable northern development there must be governmental and social changes, the recommendations for which are outside the strict limitations of this particular study component. These recommendations will fall into the realm of long range regional planning, community development, curricula planning, tourism promotion, et cetera. They are mentioned in passing here because if these cultural properties of the Outlet Lakes are to become part of Manitoba's living heritage it will be necessary to take immediate steps to promote their conservation. Steps are necessary to take cognizance of the changes in accessibility to the regions that are an indirect result of the Lake Winnipeg Regulation. The researches carried out under this study indicate that the direct adverse effects which might result from the construction of the control structure at Jen Peg will be minimal but that the far less easily defined and quantified changes in land use patterns, auxillary construction, et cetera, will have a more far reaching effect.

If nothing is done to conserve and promote the orderly use of archaeological materials and information, the opening of the area to greater public accessibility and use will result in a serious archaeological site depletion.

If on the other hand steps are taken to maximize the opportunities presented by the increased accessibility, the construction of the Lake Winnipeg regulations as planned in the spring of 1972 can have beneficial consequences.

The development of the archaeological resources in the Outlet Lakes System have emotional, psychological, and economic advantages to the local people. Native ethnic identity and local prestige could be enhanced through the research findings and through a program whereby Native people would be a part of the development of reconstruction of a traditional Native village and early fur-trade post as educational and tourism facilities. Native people should be involved in planning, construction, maintenance, and administration of these works. The popularity of places such as Lower Fort Garry, Manitoba, Upper Canada Village, Ontario, and various Native reconstructions such as Slant Village, near Bismark, North Dakota indicate the feasibility of such operations. Also, such efforts would supply income and jobs for many people after the hiring peak for the Nelson Power Project has been passed.

COMPREHENSIVE EVALUATION
OF THE
ARCHAEOLOGICAL RESOURCES
IN THE
OUTLET LAKES SYSTEM

RECOMMENDATIONS

This section on recommendations has been placed at the beginning of the report according to a prescribed format for the report. The reader should bear in mind, however, that the recommendations will be meaningful only after at least Section VI, Observations and Conclusions has been studied and, ideally, the entire report has been read.

After having read Section VI, Observations and Conclusions, the following points should be apparent:

1. That approximately 82% of Manitoba's 10,000 year old cultural heritage in the Outlet Lakes System is unwritten and/or poorly recorded and in imminent danger of being destroyed.
2. That these archaeological sites have value in the study of human history and adaptability only if they can be investigated in an undisturbed state and that these sites are crucial in understanding spring, summer and fall activities of past peoples.
3. That these archaeological sites are part of Manitoba's cultural heritage and that significant numbers of people are becoming increasingly concerned with this aspect of total societal development. The Native ethnic groups, eg. Cree, Assiniboine, Chippewyan, Dakota Sioux, are becoming more concerned about the loss of their own heritage and history, and growing numbers of Euro-Canadian descendants are becoming concerned about the loss of this data for their children and future generations.
4. That the histories and records of human environmental adaptation for one area cannot validly be fulfilled or substituted with investigations even in other adjacent areas eg. the archaeological record at The Pas is different from the archaeological record at the north end of Southern Indian Lake, and that both are different from the archaeological record of the Outlet Lakes System.

5. That the archaeological sites are fragile, non-renewable phenomena that cannot be replaced or reconstructed once they have been destroyed.
6. That the development of the archaeological resources in any area can enrich and enhance the use of that area for all following generations. The area can be enhanced through museum exhibits and dioramas or through tourist look-out stations with illustrated billboards and reconstructed villages for fur trade posts.

The recommendations are of two types. The first category consists of those recommendations which are concerned with immediate short-term problems; the second category deals with broader long-term recommendations.

Short-term Recommendations:

1. In the short time that remains, before the new water regimes go into effect, archaeological research should be conducted along the east channel of the Upper Nelson River during the summer of 1973. This research should involve one 11-man crew (the smallest effective unit in the Boreal Forest) concentrating upon selected areas where historic sites are known and where major portages are located. Intensive research and test excavations would be conducted in the vicinity of these locations eg. Warren's Landing, (Norway House I, 1812-24), Norway House community (Norway House II, 1826-present, having one known prehistoric component), and the river channel around Sea River Falls.

The survey sample from the east channel is necessary for an understanding of this prehistoric transition zone between the southeastern Boreal Forest cultures and the northern Boreal Forest cultures as well as a key fur-trade area in which the east channel was one of the main fur-trade routes.

2. We recommend that clearing and construction at Sea River Falls progress with a minimum destruction of the archaeological record. Possible clearing should be by saw rather than by bulldozer, or during the winter season, until the survey has been completed and sufficient efforts have been made to salvage the necessary data.

3. A trained and experienced archaeologist should be assigned to all major construction activities such as the clearing for and construction of roads. These individuals could assess the magnitude of data loss and conduct some salvage work.
4. In conjunction with #3, there be developed a training program to involve construction personnel in the discovery and conservation process of archaeological resources.

Long-Term Recommendations:

1. In terms of broader recommendations, planning and cost estimates should include sufficient time and funds for adequate archaeological research in future projects. In order to allow adequate time for saving the prehistoric and early historic cultural heritages, research should begin as soon as initial plans have been made.

All developmental programs should include an adequate budgetary allowance for archaeological research. The Moss-Bennet Bill before the United States Legislature recommends that 1% of all expenditures be set aside for an archaeological salvage of prehistoric and historic materials. A similar program needs to be initiated at both the provincial and federal levels in Canada.

2. In order to maximize beneficial use of new and improved roads for tourist facilities, efforts should be made to reconstruct a historic fort and a traditional Native village of the pre-European period. Local Natives should be a part of the consultation, construction, administration, and operational phases to whatever degree is possible.
3. Under present day industrial conditions, the conservation and development of cultural heritage cannot be a part-time or ad hoc undertaking. To avoid the difficulties and inefficiencies caused by having archaeological research tied to major industrial developments it is recommended that a broad based provincial program of archaeological and historical site inventory and research be established. It is further recommended that this program have functional ties to the Department of Education and Native Peoples Groups as well, the Department of Tourism, Recreation and Cultural Affairs, the Universities, Museum Associations, archaeological and historical societies.

OBJECTIVES

The initial objectives of this study were:

1. to evaluate the human history and affiliated natural history resources in the Outlet Lakes Area,
2. to assess the effects that the diversion project might have on these resources, and
3. to ultimately determine how these effects will extend to the province as a whole.

Human history resources include the total record of humanity, Indigenous and Euro-Canadian, in the area as represented by prehistoric and historic archaeological sites. In order to assess this record, it is necessary to determine the temporal and geographical distribution of each archaeological complex, to determine the density of each complex with respect to the heterogeneous topographic features, to determine the local environmental preferences, and to relate the local record to the record from other areas in order to understand the cultural processes of various cultural groups adapting to and utilizing the area. The late prehistoric and historic patterns of the Native cultural groups can be determined, in part, through ethnohistorical research, but any hypotheses must be tested against the data from archaeological sites. Much of the data on the historical record is sparse and biased toward the commercial interests of the fur trade companies and the personal interests of individual traders; the records need to be evaluated and the resultant hypotheses tested against the field data.

In order to assess the effects of the hydroelectric project upon the cultural history of the area, the number and/or nature of the sites that may be destroyed by both direct and indirect effects must be established. It is necessary to know what area is being effected by the changing water regime as well as sites being destroyed due to such activities as timber clearing, road and dam construction, and erosion of the shoreline above the mean water levels as the shoreline seeks a new equilibrium.

The actual and potential effects of the loss of the archaeological data to the people of Manitoba as a whole requires an extensive discussion of the variables attributable to a social account. A preliminary statement of the social account has been researched, prepared, and submitted to the Study Board (Syms, Kelly and Mallory 1973), but a final statement will not be forthcoming until the social account has been defined for all study components.

An initial proposal submitted by Oscar L. Mallory recommended research on "the Nelson River and affiliated lakes between Lake Winnipeg and Split Lake" (Mallory 1972a: 5). The investigations were to "be carried out beginning near the Control Structure Site at Jenpeg on the Nelson River work upstream into Kiskittogisu and Playgreen Lakes" (Mallory 1972a: 9).

C.D.A.P. was advised to concentrate the field efforts on the northern part of Kiskittogisu Lake where the greatest physical impact would occur. A single team consisting of an archaeologist, archaeological assistant, guide, and two crewmen were to conduct the field research with the archaeologist and his assistant were responsible for assessing the quantity and quality of the archaeological resources within the survey area with projections to the entire Outlet Lakes System.

The archaeological crew were charged with the location and assessment of cultural data on a stratified random sample of physiographic units along the lake. The team was also to accumulate pertinent cultural-ecological data on the geology (local), vegetation and soils. This site-specific data was to be correlated with the broader biophysical environmental picture.

IV

STUDY AREA

The total area under consideration is the combination of lakes and streams included within the term "Outlet Lakes System" (see Figure 3). This area includes the east and west channels of the Upper Nelson River from Warren's Landing to, and including, Cross Lake. Playgreen Lake, Little Playgreen Lake, Kiskittogisu Lake, Kiskitto Lake, Cross Lake, Pipestone Lake, the East and West channels, and the lower part of the Minago River comprise the water bodies of the study area.

The field research universe within which the archaeological team concentrated its efforts, consisted of the shoreline of the north end of Kiskittogisu Lake and the shoreline of the Upper Nelson River from the Jenpeg control structure south to Kisipachewuk rapids (see Map 2, Appendix A). The shorelines of Kisipachewuk, Metchanais, and Ominawin Rapids and the east and west shores of Kiskittogisu Lake from Kisipachewuk Rapids north to Whiskey Jack Bay and the mouth of Playgreen Lake were included. All islands within this boundary were part of the research universe (Kelly 1972).

Because of transportation difficulties, it was impossible to check the Jenpeg Channel between Manitou Rapids and the mouth of the river at Cross Lake. This, however, represents a minute part of the overall sample space.

Research was confined to areas along the shoreline and immediately behind the shoreline. The variable landscape along the shoreline was divided into a number of map-based topographical units in order to assure that a representative sample of the topographic variability was checked.

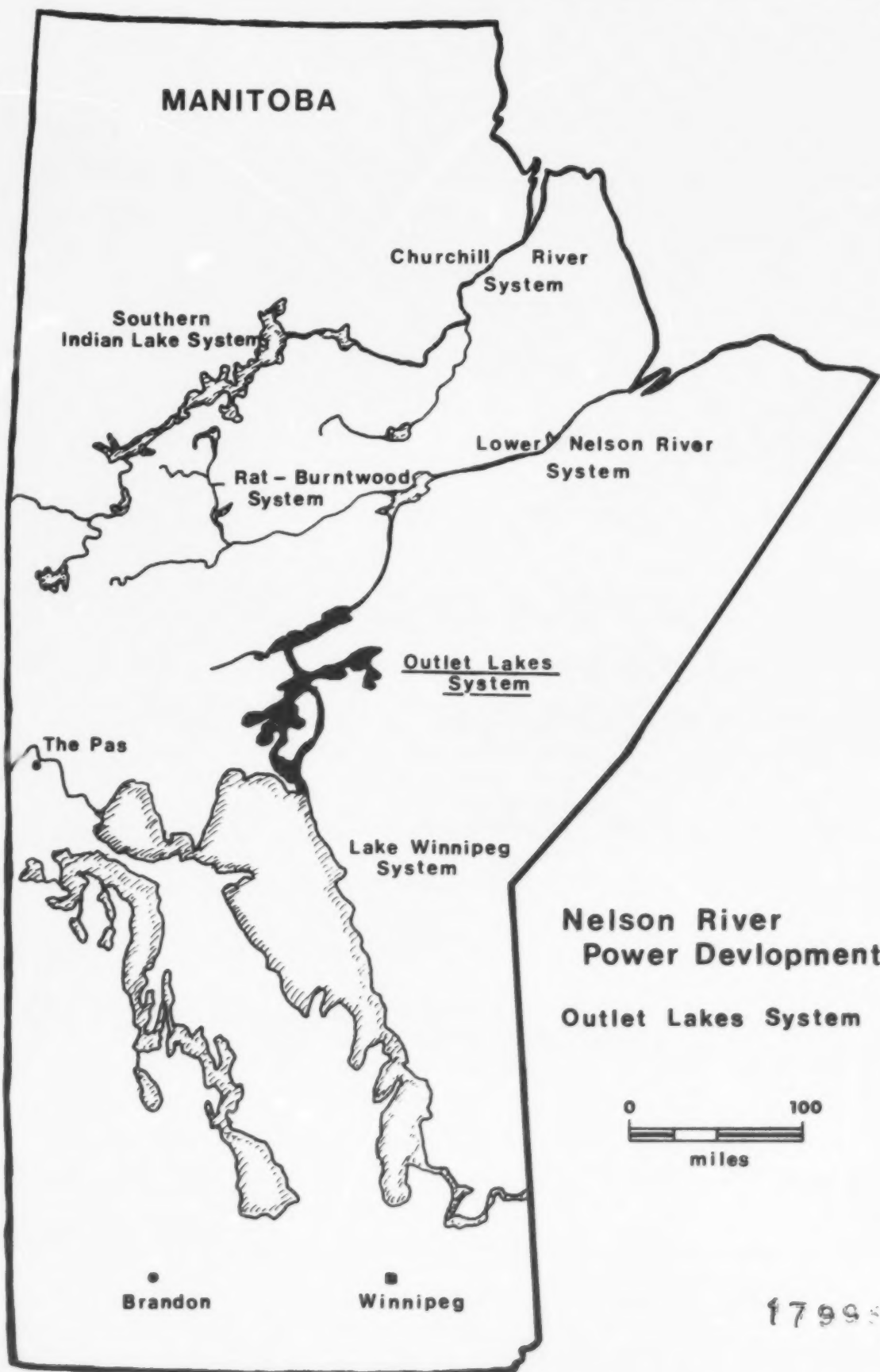


Figure 1: Map of Nelson River Power Development, Outlet Lakes System.

Field Research

Since it was impossible for one crew to adequately investigate the entire shoreline of the research area in two months, it was decided to divide the shoreline into topographically defined classes from topographic maps, that might be significant to site distribution patterns. These classes were; points, (Plate I), streams, (Plate II), islands (Plate III), bays (Plate IV), marshes (Plate V), and beaches (Plate VI). The total survey area was demarcated on topographic maps, divided according to these classes, and individual units were logged or assigned numerical designations. A 20% stratified random sample, 237 of 1,178 units, was chosen (Table 2). The sample was stratified in order to have proportional representation of each topographical zone. A random table of numbers was used to eliminate subjective biases of the researchers (see Appendix B).

TABLE 2
TEST SAMPLE OF TOPOGRAPHIC UNITS

<u>Class</u>	<u>Logged Sample</u>	<u>20%</u>	<u>Test Sample</u>
Points	238	56.6	57
Streams	29	5.8	6
Islands	304	60.8	61
Bays	218	43.6	44
Marshes	65	13.0	13
Beaches	279	55.8	56

By using a random sampling technique, statistically sound projections and statements of proportionality can be made about the total sample that exists in the survey area. A 20% sample was the maximum number of units within the field research universe that could be handled in the given time and yet it was a statistically adequate sample.

The field supervisor, Michael E. Kelly, and crew, spent more than two months visiting 230* sample units. After an initial training period, the field study was carried out by two independently travelling two man crews.

For each sample unit, the crews noted archaeological manifestations, if any were present, the local physiography, ground cover, and faunal activities. Intensive testing of the units, with a few exceptions, was not feasible because of the time and manpower elements. The crews were too small to undertake any moss removal to check for habitation evidence beneath the surface. Sites, when located, were photographed, artifacts were collected, and features and structures were noted.

Any obvious sites that were observed on topographic units, other than those in the control sample, were also recorded. These sites were also photographed and observed for features and structures.

* Part of the sample was deleted because it was impossible to travel in the lower part of the Jenpeg Channel.

Library Research

In addition to the summer field work, winter research involved accumulating data on known historic and prehistoric sites within the Outlet Lakes System. This sample was heavily biased in favour of historic sites because these sites were recorded in documents, but several prehistoric sites were located as well. The location and cultural affiliation or function of the sites was recorded and plotted.

Analysis

1. Survey Sample

The units containing evidence of human activities within the control sample were plotted with respect to the six topographic classes that were chosen (see Table 3). From this data, we were able to determine the proportion of activity units with respect to each topographic class. No evidence of human occupations were recorded along streams, whereas 43.9% of the sampled points contained sites of past human activities.

The means and standard deviations for the frequency of occurrence of sites within each class and the resultant proportions were also calculated. Only one topographic class, eg. bays, approach the mean for the total class. The range of variation in sample size of the various classes results in a high probability of variable samples of habitation examples.

The proportional calculations (Table 3) indicated a non-homogeneity of habitation sites across the various topographic classes. The number of examples found on islands approximated the mean whereas the figure for streams was much

TABLE 2
SUMMARY STATISTICS FOR CONTROLLED SAMPLE

Sample Strata	Sample Units	Units With Human Occupation	Proportion of Occupation Units To Sample Units
Points	57	25	43.9%
Streams	5	0	0.0%
Marshes	13	1	7.7%
Islands	59	11	18.6%
Bays	40	6	15.0%
Beaches	56	16	28.6%
TOTAL	230	59	25.7%
Means and Standard Deviations	$\bar{x} = 38.333$ $S = 21.77$	$\bar{x} = 9.833$ $S = 8.74$	$\bar{x} = 18.967\%$ $S = 14.24\%$

lower and the figure for points was much higher. The proportions may have been effected by the disparity in topographic class samples.

The sample of site data from the survey area was subdivided according to a chronological and function activity classification (see Table 3). These activity classes were established to determine the various uses of the sites through time. Any distribution of sites must account for possible changes as a result of changing functions due to different perceptions of land utilization. A sample of sixty-six site activity units were calculated for the fifty-nine site locations because a portion of the sites had definite evidence of multiple occupations eg., an old abandoned log cabin and a recent helicopter pad. A complete list of sites and their activity indications can be found in Appendix B.

A distinction was made between the sites found within the control sample and those that were found outside of the control sample. On the basis of the control sample of 20%, we are able to calculate the probably sample that would have been found if we had surveyed the entire shoreline within the survey area.

Sites which contained targets, survey tape, helicopter pads, styrofoam cups, rock core samples, and construction materials were classified as Recent Exploration and Construction. Commercial and Sports Hunting and Fishing Sites are recent historic sites containing shotgun shells, bullet cartridges, duck feathers, tent frames, etc. Logging Sites are sites with evidence of recent logging activities, such as mills, forest camps, and clear cuts. Portage sites are sites where trails

occur around rapids, rock outcrops, etcetera. Early Historic Sites represent sites with historic materials of the early fur trade periods. Diagnostic artifacts include early historic ceramics, musket balls, trade beads, kaolin pipes, and early metal tools such as curved pipes. Prehistoric Sites include loci which are totally prehistoric and have Native ceramics and lithic tool inventories as well as contact-period sites that include lithics and ceramics as well as minute quantities of early historic trade goods. Miscellaneous Sites consists of sample units with a variety of materials that either lacked context or were in insufficient quantities to make classificatory evaluations, eg. a few artifacts found among the driftwood on a beach.

For purposes of evaluation, the data is divided into the survey area sample of the lower part of the west channel, and the data on the east channel.

Definitions:

1. Archaeological Resources - Archaeological resources are all evidence of past human occupations which can be used a) to determine the cultural chronology, 2) to reconstruct the lifeways of the past peoples, and 3) to determine the cultural processes of ecological adaptation. These include historic and prehistoric sites of all kinds as well as artifacts and features (such as hearths), environmental data, and the contextual interrelationships of the artifacts to one another and to the environment.
2. Culture - Shared learned patterns of human activity, evident in behaviour, and the results of behaviour. It is expressed in the archaeological record in technological, formal, and decorative preferences as well as environmental preferences.
3. Culture History - The chronological and spatial framework for the development of human societies and their cultures and the documented processes of change involved in this development. These studies include a chronological temporal framework and patterns of spatial interaction between and within cultural provinces.

4. Cultural Province - A cultural province or area is a region with a unique manifestation of customs and patterned behaviour.
5. Direct Impact - The effects an action will have on environmental resources as a direct and immediate result of construction or development. This includes such effects as destruction of archaeological sites and their context by earth-moving, plowing, flooding, or building construction.
6. Indirect Impact - Effects on the environment which are not an immediate or direct result of an action, but which would probably not occur without it. Indirect effect is the extent to which a project or action exposes resources, either within or adjacent to the development to such adverse effects as acceleration erosion, construction of private homes or commercial buildings, road-building, increased vandalism, or other activities attendant on the action.
7. Preliminary Survey - A preliminary survey involves a rapid areal reconnaissance using only naturally occurring surface indication to determine site location.
8. Intensive Survey - An intensive survey involves a slow area reconnaissance employing various testing techniques to locate buried sites and to determine the horizontal extent and depth of cultural deposits.

9. Extensive Excavation - Extensive excavation requires a detailed investigation of a localized site or site clusters to accumulate data on number, type and distribution of activity areas, economic subsistence resources, technological materials and methods, social organization, and religious practices.

Survey Sample

The nature of the preliminary survey sample reflects the field techniques plus the characteristic of the lake shoreline. The two survey crews of two men had to check a large number of sample units (237) in order to obtain the 20% stratified random sample. They had insufficient time to do more than a cursory shoreline examination and had no time to extensively check in or under the moss as is done in an intensive survey such as was carried out along the portion of the diversion route. As a result, they were able to record only surface manifestations. In recognizing these inadequacies, future research must include funds for applications of proper survey techniques utilizing more and larger crews which could take time to investigate more sample units including a thorough search for manifestations within the moss (see Wiersum 1973). Relying on surface manifestations severely curtails evaluations and hypotheses about the area since vast amounts of the prehistoric and historic data were, or may have been, concealed in the moss covering.

In addition, only a minute part of the total Outlet Lakes region was covered. Since prehistoric and historic peoples inhabited the region according to varying environmental potentials throughout different seasons, we cannot state that the results for the north end of Kiskittogisu Lake in any way reflect the record of

the south end of Kiskittogisu Lake, Playgreen Lake, or the East Channel of the Upper Nelson River.

Finally, the lake shore was not conducive for revealing information on past activities. For example, much of the shoreline consisted of low marshy areas that are overgrown with vegetation; the north end of the lake had a relatively small proportion of sand or clay beaches like those found on Southern Indian Lake.

On the basis of the sample and given the above limitations, we can ascertain only that the north end of Kiskittogisu Lake has received intensive use in the recent historic period (see Appendix B and C). While no evidence of prehistoric sites nor early historic sites was found, we must emphasize that the sampling problems must be considered when evaluating these earlier periods.

Three sites were tested briefly (Plate IX and X). These sites, UNR202, 204, and 205 (see Appendix D, Appendix E, and Plates XI - XV) represent Native trapping and fishing camps. The artifacts included a mixture of traditional Native materials such as moose metacarpal hide scrapers and current technological debris such as tin cans.

Sites UNR204 and 205 represent a scattered complex of abandoned cabins (Plates XI and XII) with features such as meat racks (Plate XIII) and graves (Plate XV). The two clusters of cabins were joined by cleared trails through the bush. These sites are important because they are concrete examples of Native resident patterns that provide analogies for interpreting other archaeological remains.

The general nature of the site indicates several similarities to the traditional Mistassini Cree camps described by E.S. Rogers (1967). Excavations at UNR204 and 205 would yield important comparative data on the Native peoples living with technological and cultural patterns that combine the technologies of Native and Euro-Canadian traditions in an essentially traditional economic livelihood of trapping.

These two sites are above any high water levels that will result from the Nelson Power Project, however, they are in danger of destruction due to erosion caused by the changing water levels. These sites are located on a high clay bank in Whiskey Jack Bay; the clay bank is likely to become unstable, resulting in slumpage and erosion landward as the new water levels undercut the current bank.

The local Natives who use this area will probably become concerned about the exposure of deceased relatives as the bank slumpage approaches the graves.

East Channel Data

The data on this area is based upon library research which has produced its own biases. The sources represent Euro-Canadian reports and are concerned primarily with the fur trade period. It is apparent that the east channel of the Upper Nelson River was one of two main canoe routes during the early historic period (see Figure 2). As the travellers journeyed up the Hayes River from York Factory, they could travel either by means of:

- a) the Hayes River, Echimamish River, east channel of the Upper Nelson River, Little Playgreen Lake, and north end of Lake Winnipeg, or

- b) the Hayes River, Fox River, Big Stone River, Bear Lake, Cross Lake, and Minago River.

While both of these are well-known historic trails, other trails were undoubtedly used and may have been more important in the prehistoric periods; this can only be determined through comprehensive research.

There are at least five fur trade posts in the Outlet Lakes System (see Appendix F) and two more located on attached water bodies. These are Norway House I (1814-24) at Warren's Landing, Norway House II and III (1826-present) at the present community of Norway House, Jack River House (1801-1817), Rossville Post, Cross Lake House, and Sipiwesk House. A number of important geographical spots which warranted comments by early travellers are also known, eg. High Rock, Sea River Falls, and Robinson Portage.

Some of these posts were temporary structures while others were inland depots for the distribution of materials from York Factory. The initial distribution of inland posts was determined by the movement of the Natives; later, the distribution of the Natives was determined, to some degree, by the locations of the posts. The complex pattern of socio-economic interdependency between forts and Natives has not been researched sufficiently.

Known prehistoric sites include habitation sites at Whitefish Island (Hlady 1971:59) and Norway House, stone quarries on Playgreen and Pipestone Lakes, and a pictograph site (stone paintings of religious significance) on a small tributary of Molson Lake.

The pottery from two prehistoric habitation sites contained Late Woodland Manitoba Phase pottery (A.D. 800-1600) which has its main distribution to the southeast, in southeastern Manitoba, southwestern Ontario, and northeastern Minnesota. The fabric-impressed pottery on Whitefish Island is from a different Woodland tradition with different cultural patterns and could have been left by people who were living in either The Pas region or the Southern Indian Lake region (Dickson 1972). Sampling the sites would enable us to study the geographical and cultural relationships of these people who had occupied these habitation sites.

The presence of Manitoba Phase pottery raises many questions about the prehistoric utilization of the Outlet Lakes System. This type of pottery has not been found on Southern Indian Lake nor on the Lower Rat-Burntwood System. Were the prehistoric peoples who left behind the Manitoba Phase cultural remains living in the area or were they merely passing through the area? The Outlet Lakes System potentially offers answers to some important questions in terms of distributions and movements of prehistoric populations.

Total Outlet Lakes System

Despite the small sample of the field research area and the limited sources of data for other parts of the Outlet Lakes System, we can make some predictive statements about the probable cultural history based upon knowledge of other areas.

Parts of the Boreal Forest have probably been occupied for the last 10,000 years. Areas to the north and west of the Outlet Lakes System have yielded projectile points classed as Late Paleo-Indian (Agate Basin or Keewatin type projectiles)

which have associated dates of 6600 B.C. and 8040 B.C. from sites on the Great Plains (Wright, in press).

The Middle Woodland Complex (also referred to as Initial Woodland or Laurel Phase) lasted from about 700 B.C. until about A.D. 600. Several Middle Woodland sites were found on the Lower Rat-Burntwood System but little evidence exists elsewhere in the Boreal Forest of northern Manitoba. Most of the evidence for Middle Woodland materials exists in southeastern Manitoba. There is no indication, yet, as to whether these people passed through the Outlet Lakes System to reach the Rat-Burntwood System, the dates when these peoples occupied these northern areas, nor what their lifeways were like.

The Late Woodland Period lasted from possibly A.D. 600 or 800 to the historic period. There are at least two different archaeological cultures. In the areas of Southern Indian Lake System (Dickson 1972b, Wright 1968, press) and the Rat-Burntwood System (Wiersum 1972), pottery representing the Clearwater Lake Phase has been found. Similar materials have been found on Whitefish Island in Playgreen Lake (Hlady 1971). Materials referred to as Manitoba Phase pottery (MacNeish 1958) or Blackduck Pottery have also been found on Whitefish Island in addition to the shoreline at Norway House.

These Manitoba Phase materials appear to have spread rapidly into the Boreal Forest circa A.D. 800 and persisted until the historic period, during which time regional variations developed. Manitoba Phase pottery is found in the southeastern part of the province and has not been found in areas to the north of the Outlet Lakes

System. This latter system may represent the northern periphery or it may merely indicate the importance of the area as a prehistoric transportation route.

The early historic period finds the Outlet Lakes System being used intensively. The Crees and Assiniboines were using the East Channel of the Upper Nelson River and the Cross Lake - Minago River routes to move from the Boreal Forest into the Aspen Parkland (Ray 1971). The Hudson's Bay Company was setting up inland forts and were using the same routes. Early settlers are using the East Channel of the Upper Nelson River to travel from York Factory to the Red River settlement.

Unfortunately we have only a "glimpse" of what is happening because neither the prehistoric nor the historic archaeological research has been conducted. The rising water levels of the Nelson Power Project will undoubtedly obliterate much of this record forever.

The main conclusion that can be drawn from the field and library research on the human history resources of the Outlet Lakes is that a great deal more concentrated field study is necessary to validly determine the archaeological potential of the Outlet Lakes.

A comparison of the Kiskittogisu Lake Survey to the Rat-Burntwood study emphasizes the preliminary nature of the Kiskittogisu work.

In the Rat-Burntwood study the research universe held 255 miles of shoreline of which 108 miles of shoreline and bush zone were examined. In this work only 3 sites were discovered by beach examination as opposed to 29 sites located in

the bush zone, under the moss covering. In other words 1 beach site was found on an average of every 36 miles of shoreline examined.

For two reasons, it is thus not surprising that no beach sites were found in Kiskittogisu, first it was possible to examine, in detail, only 20 miles of shoreline and secondly there are no mud or sand beaches which would have been suitable camp or resting spots.

If on the other hand we assume there is a similar bush site distribution pattern for both areas then within the 110 miles Kiskittogisu 1972 research universe one might expect a ratio of 108/29 or roughly 30 sites to be situated in the bush adjacent to the shoreline. As was demonstrated in the Rat-Burntwood study the discovery of bush sites requires large crews to expose sufficient ground surface.

Much of the archaeological record will be lost. The sites will be subject to increased erosion due to higher mean water levels and a variety of construction activities. From the ethnographic record, we can determine that a majority of spring, summer, and fall camps of the traditional Native peoples tended to be close to the shores of the rivers and streams.

The traditional Cree seasonal cycle of activities in the 1600's and early 1700's was to spend the spring, summer and fall on the lakes in this southern Boreal forest region and to winter in the Aspen Parkland (Ray 1971). During some years they may have wintered inland in the Boreal forest particularly if the caribou had migrated that far south as they did in the 1950's (Kelsall 1968) or if the moose were

sufficiently numerous. Since the density of moose populations varied in a cyclical pattern, the Natives would alter their winter plans to adapt to the animal movements.

In terms of a base-line situation in which there was no hydroelectric project, there would be a small continuous rate of site destruction due to fluctuating water levels and pot-hunting (the collecting of artifacts from sites by people who like to have objects different from their neighbours), or collecting as a scientific hobby (see Figure 4). With the implementation of preparation for construction of the hydroelectric project, and the effects for the project, the rate of site destruction will escalate rapidly. Some sites such as Norway House I will be inundated as a result of consistently higher water levels at the north end of Lake Winnipeg. The historic site of Jack River House and the historic Hudson Bay Post on Cross Lake will be destroyed, if there is anything left of them now.

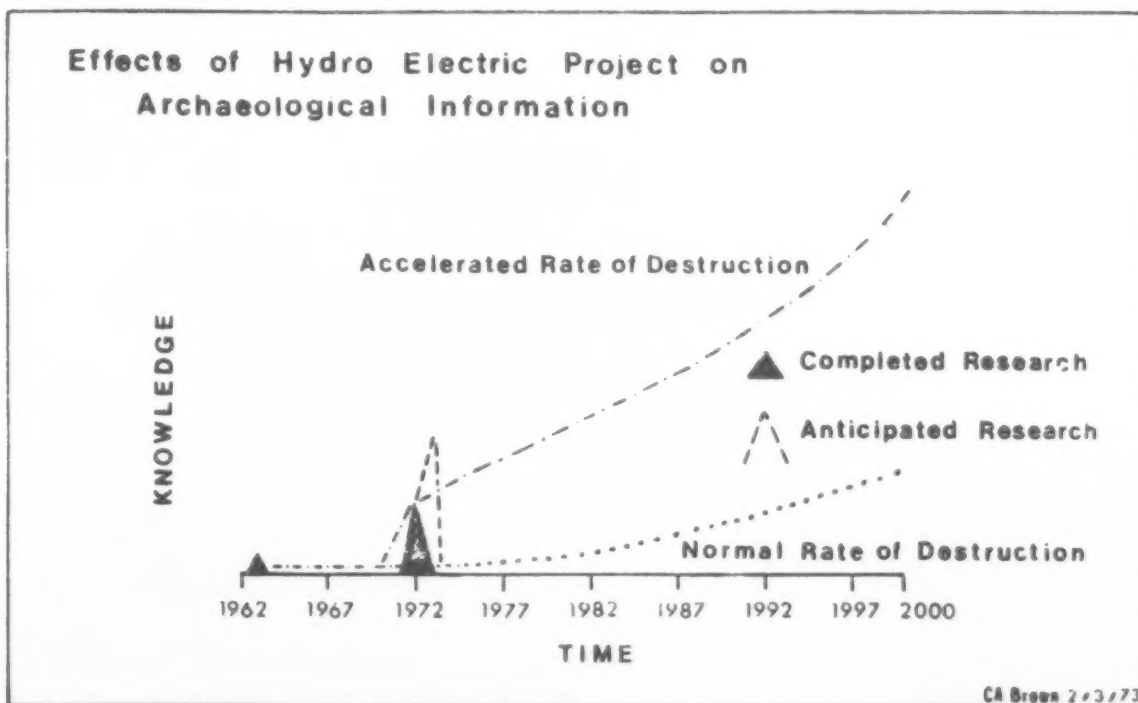


Figure 4: Effects of Hydro Electric Project on Archaeological Information.

The prehistoric and historic data at important portages such as Sea River Falls will be destroyed by construction and/or park development unless some of the archaeological record is rescued before construction proceeds. Since rapids such as Sea River Falls represent stopping places on major fur trade routes, they are indicative of major prehistoric routes as well because the early fur traders learned from the Native peoples where the best canoe routes were located.

A study of the available literature indicates evidence of prehistoric populations in Playgreen Lake and the east channel of the Upper Nelson River. The number of sites that would be effected cannot be ascertained because the research has not been conducted in these areas. It is apparent, however, that prehistoric habitation sites and special activity sites such as quarries were used for at least the last 1,000 years, and possibly for as much as 10,000 years.

With respect to the Northern Kiskittogisu locality of the west channel, we can say that the only known sites of archaeological significance that are likely to be destroyed are UNR204 and UNR205 on Whiskey Jack Bay. These sites could yield important archaeo-ethnographic data in terms of settlement pattern, intra-site activities, and burial practices. These sites are well above the water level but an increase of the water level from the current 709 MSL to the 715 MSL would result in erosion of the clay bank on which these sites are located.

In addition to the loss of data due to the destruction of specific sites, there is a loss of an overall interpretative framework for the prehistoric and early historic fur-trade periods. With respect to the fur trade posts, we would be losing evidence

that would lead to an understanding of the network of small temporary posts to larger depot posts such as Norway House to main posts such as York Factory.

The interpretive framework for the prehistoric and early historic Native cultures will also be severely reduced as a result of site loss. In the survey area of the north end of Kiskittogisu Lake, there is no record of prehistoric peoples; this absence could reflect inadequate sampling, in which case a survey with a large crew should be implemented, or it could indicate that the area was not used until population pressures of the late historic period forced people into the region, since the area is intensively occupied during the post A.D. 1800 period.

The aboriginal summer settlement pattern should have included the entire area encompassed within the Outlet Lakes research area. Kiskittogisu Lake would be an important lake for the summer grazing of moose because of the numerous low marshy shorelines.

By looking at the intense utilization in the historic period, the natural carrying capacity of the area, and the traditional patterns of resource utilization, we can predict that there are sites in the area. Further research is advised to substantiate these predictions.

Both known and predicted sites of the prehistoric, early historic, and historic periods are being destroyed. The interpretative and analytical frameworks for understanding the cultural heritage of both Native and Euro-Canadian Manitobans will be effected. Previous programs such as the Grand Rapids Hydroelectric Project have altered the archaeological record in many parts of the province.

The archaeological resources are a very fragile resource that will definitely be affected by the hydroelectric project. This resource is non-renewable and cannot be transplanted. It has been estimated by Oscar Mallory that 82% of the archaeological sites associated with Southern Indian Lake will be destroyed by direct and indirect effects of the flooding; a similar figure is probably valid for the Outlet Lakes System.

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APPENDIX A

SAMPLE UNITS SELECTED FOR INVESTIGATION.

<u>Points</u>					
009	088	145	200	252	Added
029	089	148	215	254	284
030	096	151	216	264	Deleted
032	106	156	220	269	042
036	110	159	223	273	N= 57
042	117	161	224	275	<u><u> </u></u>
043	126	167	230	276	
047	132	168	236		
050	133	174	242		
064	135	181	245		
069	140	193	246		
071	142	198	249		
075					
076					
<u>Streams</u>					
002					Deleted
007					002
017					N= 5
020					
021					
025					

<u>Beach</u>					
001	053	119	169	228	Added
007	058	120	173	230	280
008	062	128	180	240	Deleted
012	064	134	184	242	001
018	068	137	188	244	018
022	076	143	190	245	022
024	085	145	193	264	N = 56
026	089	149	197	272	
044	096	155	203	274	
045	101	156	206	277	
050	110	160	211		
051	116	166	227		

<u>Bays</u>				
001	058	119	160	Added
003	063	122	178	219
007	066	123	184	220
012	070	125	186	
018	078	126	187	Deleted
019	079	130	198	001
034	085	141	203	003
040	098	142	210	012
045	110	143	214	018
048	113	155		019
055	115	154		040
056	118			N=40

<u>Marshes</u>						
001	043	063				N=13
003	049					
010	050					
014	051					
018	056					
037	060					
<u>Islands</u>						
001	060	127	168	219	274	Deleted
006	061	132	175	220	291	001
009	064	133	176	221	294	006
011	068	134	193	223	296	009
012	077	135	195	236	301	011
013	078	137	198	239	304	012
026	083	145	199	243		013
044	085	153	201	250		026
045	096	154	203	253		N=59
051	098	157	205	257		
052	107	160	206	268		
054	117	161	210	272		

APPENDIX B

CONTROLLED SAMPLE DATA

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UNIT #	MAP	TYPE OF ACTIVITY
Beach 044	Hydro 8	1) Surveyor's tape 2) Drift fish float; gin bottle, etc.
Beach 045	Hydro 8	Bulldozed clearing (Hydro)
Beach 076	Hydro 7	Logging camp and clear cut
Beach 101	Hydro 5	2 wood burn stove legs R.F. #2
Beach 119	Hydro 5	Rusted tub, bone
Beach 120	Hydro 5	Hydro camp (temp.) and mess
Beach 137	Hydro 4	Axes cut stakes, drift
Beach 156	Hydro 5	Sharpened stakes; ice sled
Beach 166	Hydro 5	Tent frame camp
Beach 180	Hydro 4	Hydro experiment station
Beach 188	Hydro 4	Long portage around Kiskittogisu Rapids Hydro trash
Beach 190	Hydro 4	1) Portage 2) Hydro construction work
Beach 193	Hydro 4	Camp tent poles
Beach 211	Hydro 4	Oar fragment
Beach 242	Hydro 2	Hunter's camp, rusted cans, sawed moose bones
Beach 264	Topo 2	Drift boards (sawed)

UNIT #	MAP	TYPE OF ACTIVITY
Bay 045	Hydro 8	Hydro chopper pad
Bay 063	Hydro 8	Board and nail (probably drift)
Bay 070	Hydro 8	Hydro Whiskey Jack Bay Camp
Bay 026	Hydro 5	Hydro chopper pad and mess
Bay 184	Hydro 4	1) Hydro chopper pad 2) Clearing and trail and sled
Bay 219	Hydro 4	Log cuttings
Point 029	Hydro 9	Surface fire-trash
Point 032	Hydro 9	Hydro chopper pad
Point 064	Hydro 8	Surveyor's tape
Point 069	Hydro 8	Hydro survey marker and water gauge
Point 071	Hydro 8	Surface fire
Point 075	Hydro 8	Trap set
Point 088	Hydro 8	Cabin camp UNR204
Point 089	Hydro 8	1) UNR205 Cabin camp 2) Chopper pad hydro
Point 096	Hydro 8	Portage
Point 110	Hydro 7	Surface fire and tin cans

UNIT #	MAP	TYPE OF ACTIVITY
Point 126	Hydro 5	Surface fire and .30 - .30 shells
Point 133	Hydro 5	Recent fish hunt activities Beach debris - glass, scissors, etc.
Point 140	Hydro 5	Surface fires
Point 142	Hydro 5	Duck blind and 12 gauge shells
Point 151	Hydro 5	Hydro survey target
Point 167	Hydro 5	UNR201
Point 216	Hydro 4	Trash
Point 224	Hydro 4	Fish camp and tent frame
Point 168	Hydro 5	Recent camp: 3 fires
Point 236	Hydro 2	Axe cut timbers and trash
Point 242	Hydro 2	All timber cut - chain saw (hydro)
Point 252	Hydro 2	Hydro survey target
Point 254	Hydro 2	Portage
Point 273	Topo 2	Fish camp hut - single
Point 284	Hydro 5	Portage
Marsh 010	Hydro 8	Hydro construction activity

NON-CONTROLLED SAMPLE DATA

UNIT #	MAP	TYPE OF ACTIVITY
Beach 000	Hydro 9	Jenpeg Power Plant and camp
Beach 028	Hydro 8	Ominawin Bypass Channel clear cut
Beach 065	Hydro 8	Ominawin Bypass; channel clear cut
Beach 185	Hydro 4	Hydro rock core samples Kisipachewuk Rapids Target
Beach 189	Hydro 4	Kisipachewuk Rapids portage
Beach 213	Hydro 4	Tent frame
Beach 234	Hydro 2	Three bunk trapper's cabin used 1971, Prairie Jigger Muskrat and Otter drying boards, several collapsed cabins nearby.
Beach 255	Hydro 1	3 cabin fish camp
Beach 260	Topo 2	Abandoned saw mill
Point 019	Hydro 9	Hydro Chopper Pad
Point 065	Hydro 8	Hydro Chopper Pad
Point 078	Hydro 8	Hydro Experiment station
Point 079	Hydro 8	Hydro cable car mooring
Point 080	Hydro 8	Barge landing, cabin for Hydro caretaker - now abandoned
Point 093	Hydro 8	Ominawin Rapids Portage
Point 094	Hydro 8	Ominawin Rapids Portage

UNIT #	MAP	TYPE OF ACTIVITY
Point 112	Hydro 7	Tent frame and rusted junk
Point 134	Hydro 5	Surface fire, egg shells, stove pipe
Point 158	Hydro 5	Surface fire - surveyor's tape
Point 175	Hydro 5	Portage - Metchanais Rapids
Point 176 - 284	Hydro 5	Cable car across Kiskittogisu entrance; Metchanais Rapids
Island 025	Hydro 9	Portage Manitou Rapids
Island 120	Hydro 6	Hydro Chopper Pad
Island 172	Hydro 5	Portage Metchanais Rapids
Island 300	Topo 2	Single shed fish camp; Carl dram
Bay 045	Hydro 8	Hydro Chopper pad
Bay 090	Hydro 8	Hydro Chopper pad

APPENDIX D

DESCRIPTION OF SITES ASSIGNED UNR DESIGNATIONS¹

UNR201: Sample Unit: Point 167
Name: (None)
Location: Upper Nelson River

This site is at the base of a point in a sheltered bay. A thick stand of poplar shelters the area from prevailing northwest winds. A verticle three meter high rock outcrop defines the southeast extent.

The site is defined as a concentration of sharpened wood stakes lying in the leaves at the base of the outcrop.

A weathered paddle was also collected from the drift wood along the beach. A Hydro surveying target was placed at the tip of the point.

UNR202: Sampel Unit: Island 117
Name: Firth Site
Location: Upper Nelson River

This site is a hunting and fishing camp that has been dated by Rubin McKay of Cross Lake as to have been occupied by his and several other families during 1939 for the purpose of fishing commercially for sturgeon.

The site is in two areas located within 1/8 of a mile of each other. The site proper is in a poplar copse behind a point on the island and Area-2 just to the south is behind a sheltered mud beach bay.

¹

Michael E. Kelly (1972: 5-8)

Features noted were three tent placements, a surface fire deposit and a concentration of fish bone excavated as F-1. Materials collected include unworked moose bone, a tobacco tin, and a bone flesher.

UNR203: Sample Unit: Island 272
Name: (None)
Location: Upper Nelson River

This site is a sprawling open camp site apparently associated with hunting and fishing activities.

Features at the site include a collapsed spruce tent frame, a large flat stone wind break on rock outcrop for a surface fire, several post and pole structures. Material observed on the site were unworked moose bone, a gill net, and tin rubbish. All materials were left in situ.

UNR204: Sample Unit: Point 088
Name: Arppe Site
Location: Lake Kiskittogisu

This site is located on a high terrace above the shoreline of Whiskey Jack Bay. The most noticeable feature (recorded as F-5) on the site is a partially collapsed log cabin in a large clearing - well removed from the terrace edge.

Excavations on the site consisted of two excavation units dug in an attempt to gather data on three mounds found along the terrace edge. Two of the three mounds exhibited wood remains on the surface. These remains have been tentatively identified as a wooden box on Mount F-2 and a grave marker and

picket fence on mound F-4. Excavation of the three features, however, produced inconclusive results in the form of the absence of any cultural materials. There were also discovered a number of pits, located within the site area.

UNR205: Sampel Unit: Point 089
Name: Chopper Pad Site
Location: Lake Kiskittogisu

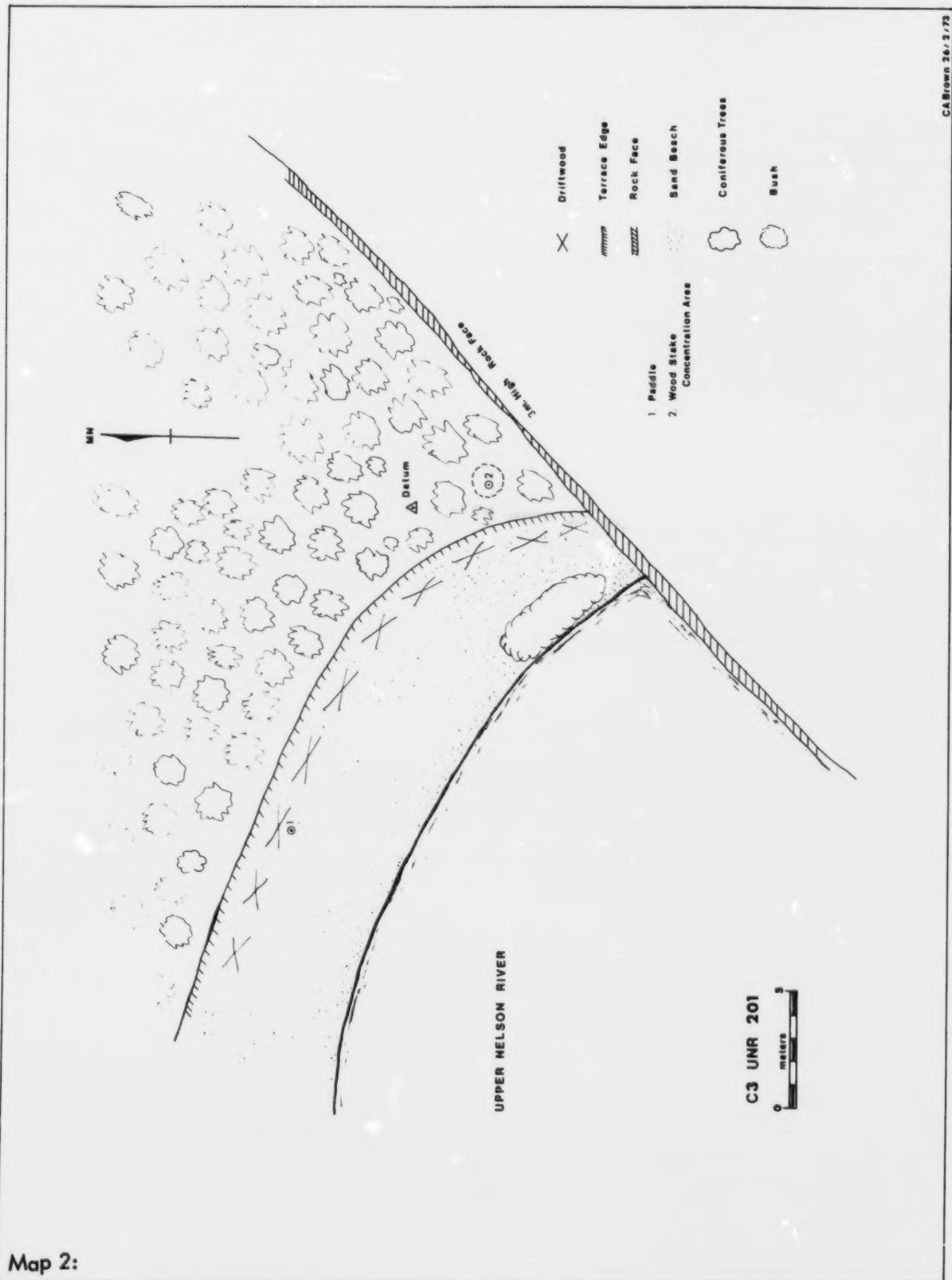
The primary concentration of remains fell within a quarter acre area again atop a high terrace above Whiskey Jack Bay. This area manifested eight recorded features: Three cabins, two pits, a winter meat cache, and two log structures of undetermined function.

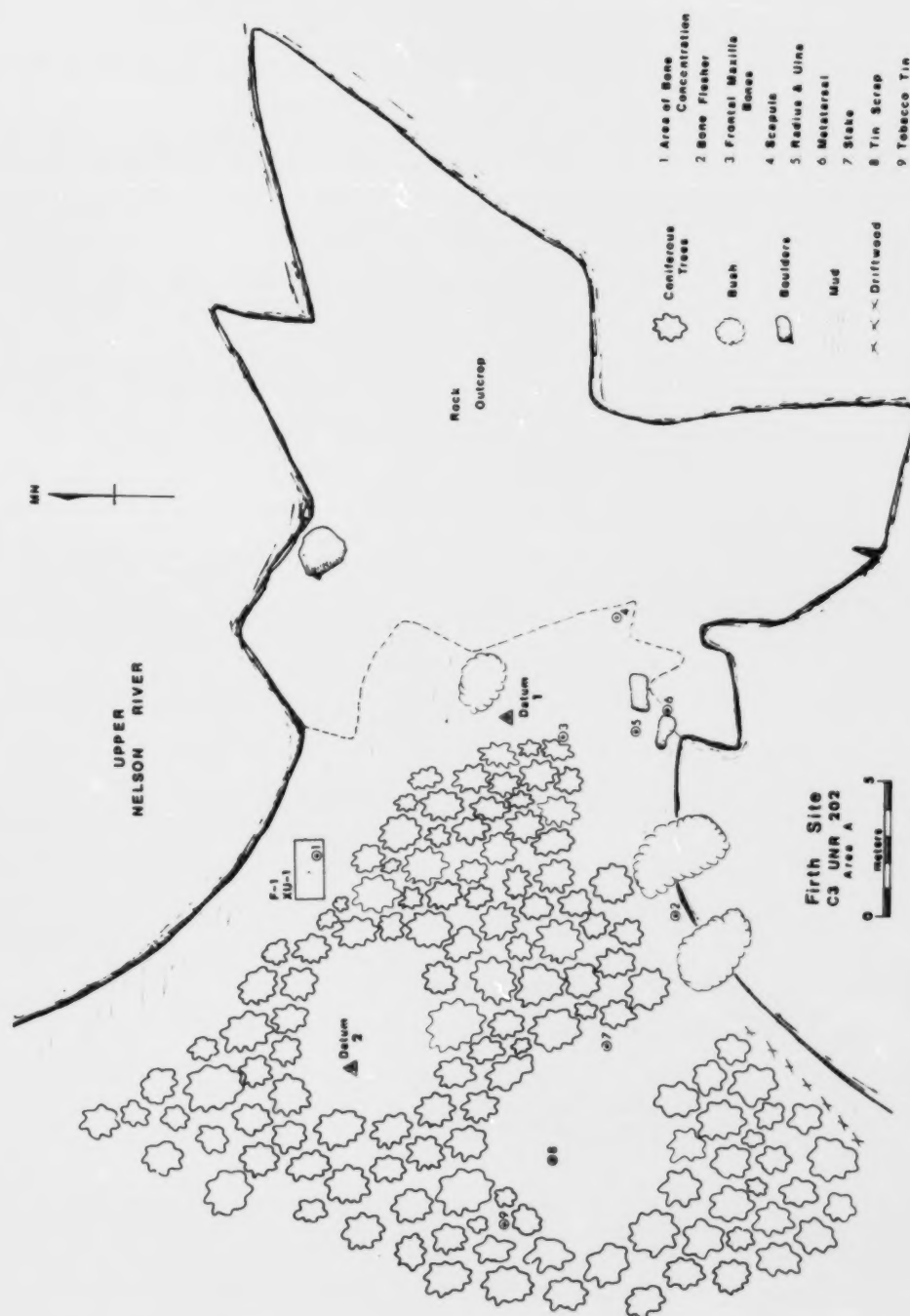
Two other features included within the UNR205 designation are a cabin (F-9) located some 200 feet to the south along the terrace edge of the main concentration, and another cabin (F-10) located some 1 1/4 miles to the south-east, adjacent to a large bay on Playgreen Lake.

Three test excavations were undertaken as part of the site record. Test 1 was a 1 by 2 meter square in a corner of the most deteriorated cabin (F-1). The collapsed roof beams and floor boards of the cabin were isolated and within the fill were found a china sherd, two tin cans, a baking powder tin top, and a spoon.

Test 2 was an attempt to provide data on one log structure (F-2). A 1 by 1 meter square was dug in the south half of the structure. Materials recovered were exclusively faunal remains. Test 3 was excavated to cross-section one of the pits; no materials were discovered.

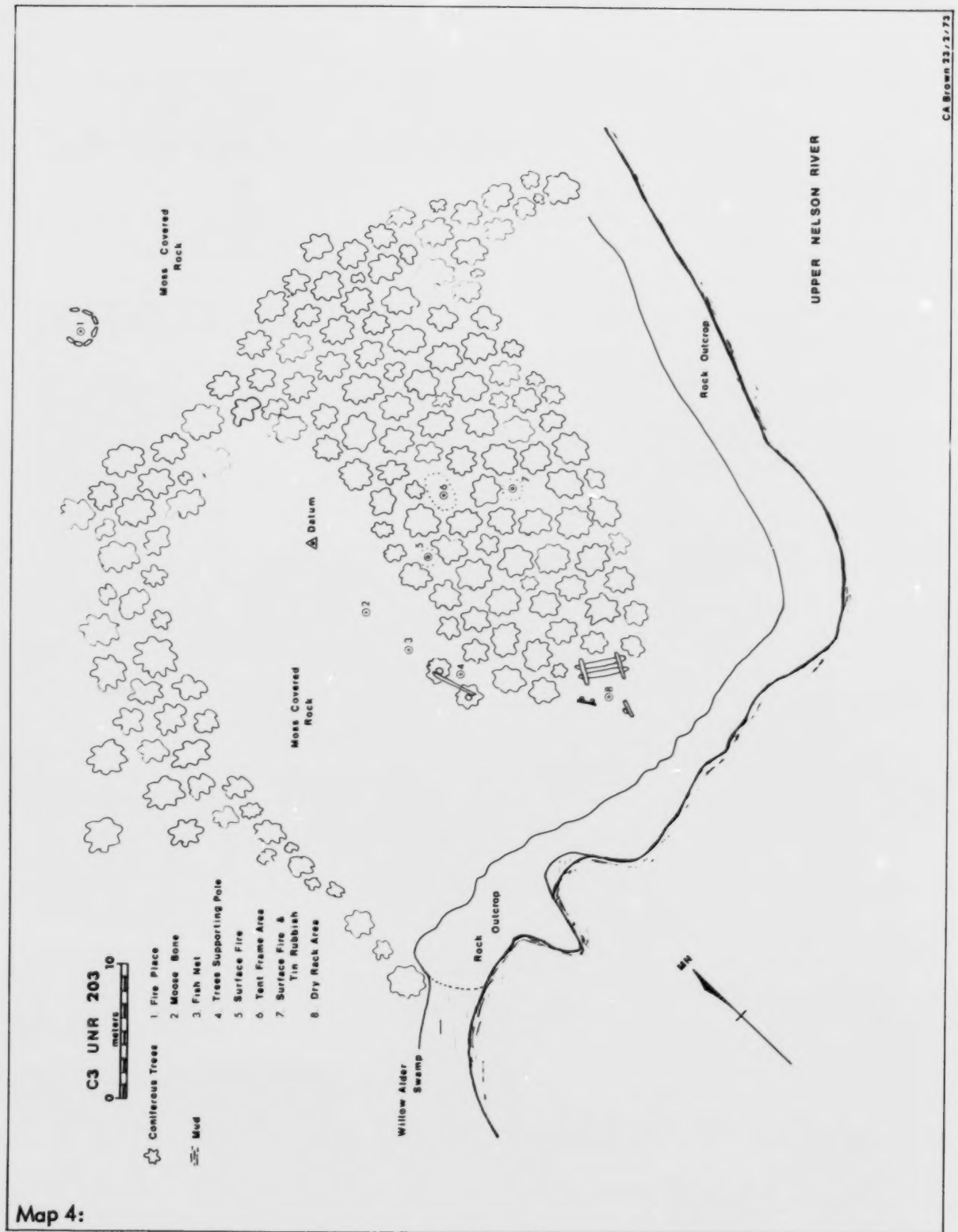
A system of cleared roadways running through the bush connecting the cabins (F-1, F-3, F-7) the primary area of UNR205 with cabins F-9 and F-10 under the same site designation and the cabin area of UNR204 together. A roadway also leads from the clearing at UNR204 down to the lake.



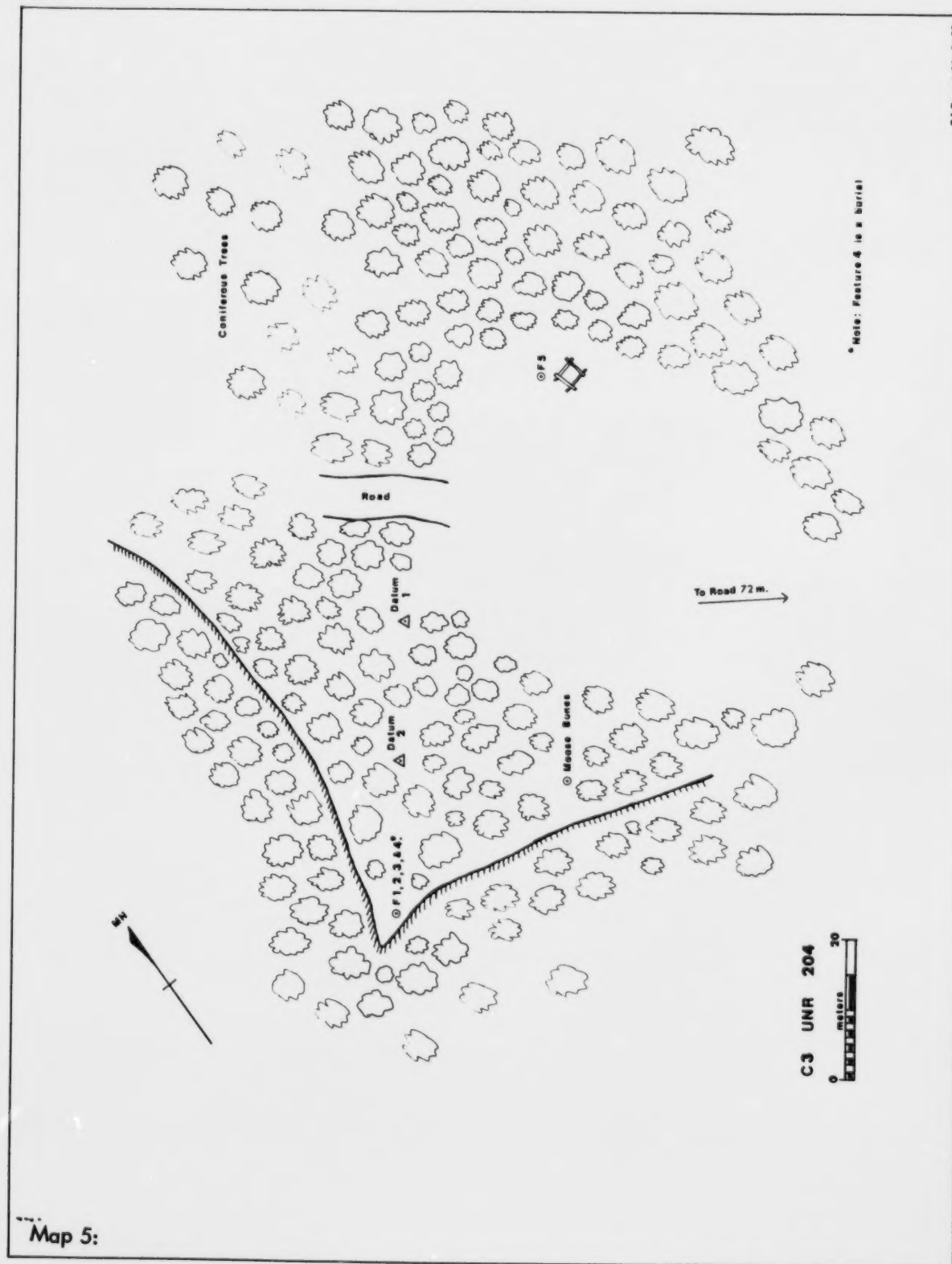


Map 3:

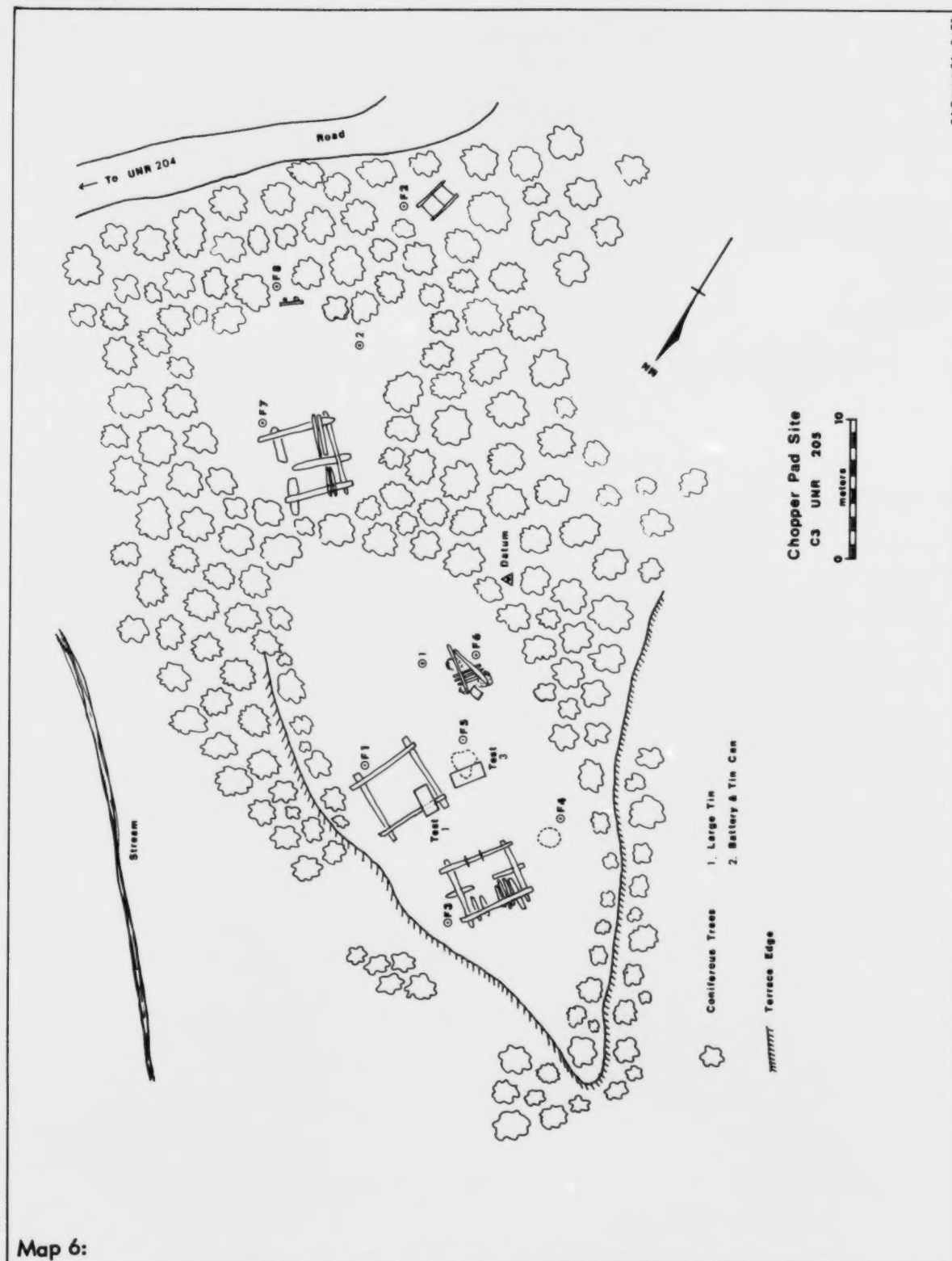
APPENDIX E



APPENDIX E



APPENDIX E



APPENDIX F
DATA ON SITES FROM NON-SURVEY SOURCES

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SITE	LOCATION	CONDITION	SOURCE
Norway House I, Hudson Bay Co. Post, 1814 - 1824	Near Warren's Landing	Unknown	Morse (1968: 41-2)
Norway House II, Hudson Bay Co. Post, 1826 - Present	Little Playgreen Lake	Currently in use	Morse (1968: 42)
Jack River House, Hudson Bay Co. Post, 1801 - 1817	Small island at mouth of Gunisao River	Unknown	James Chism, staff, arch. historic sites service (1970 office comm.)
Rossville Post	2 miles east of Norway House, east shore of Little Playgreen Lake	Unknown	Hudson Bay Company Archives
Cross Lake House, Hudson Bay Post, 1790's - Present	Several locations; record unclear	Unknown	Hudson Bay Company Archives
Sipiwek House, Hudson Bay Co. Post, 1792 - 93	West shore, Sipiwek Lake	Unknown	Journal of Hearne and Turnor, Tyrrell ed. (1934: 568)
White Fish Island, Indian Prehistoric	Playgreen Lake	Undisturbed	Hlady (1971)
Norway House Community. Indian, Pre - and Proto Historic	Little Playgreen Lake	Unknown	Hlady (oral communication)
Sea River Falls, historic Voyageur Portage	Sea River Falls; East Channel Upper Nelson River	Unknown	Morse (1968) Bell (1879)
Pictographs Indian	On One Three Creek entering Molson Lake at south-west shore	Unknown	Robert Olson (1972 personal communication)
Painted Stone portage; Historic Voyageur Portage	Sources of Hays and Echimamish Rivers	Unknown	Morse (1968) Josephy (1970)
Robinson Portage Historic Voyageur	Series of falls on Hays River east of east end Robinson Lake	Unknown	Morse (1968)
Pipestone Quarry; Indian	Pipestone Lake	Unknown	Bell (1879)
High Rock, Historic Voyageur Camp	East Channel, Upper Nelson River	Unknown	Robert Olson (1972 personal communication)



PLATE I Point Class: Point With Island in the Background. UNR00 (2794)



PLATE II Stream Class: Beaver Dam Across Stream. UNR00 (2661)



PLATE III Island Class: Shoreline of Group of Islands at Metchanais Rapids.
UNR00 (2771)



PLATE IV Bay Class: Bay in West Channel of Upper Nelson River Near Kiskittogisu
Lake. UNR00 (2676)



PLATE V Marsh Class: Marsh in Jenpeg Channel. UNR00 (2783)



PLATE VI Beach Class: Beach at Upper Ominawin Rapids. UNR00 (2797)



PLATE VII Bulldozed Clearing at Ominawin Bypass, Shoreline View. UNR00 (2657)

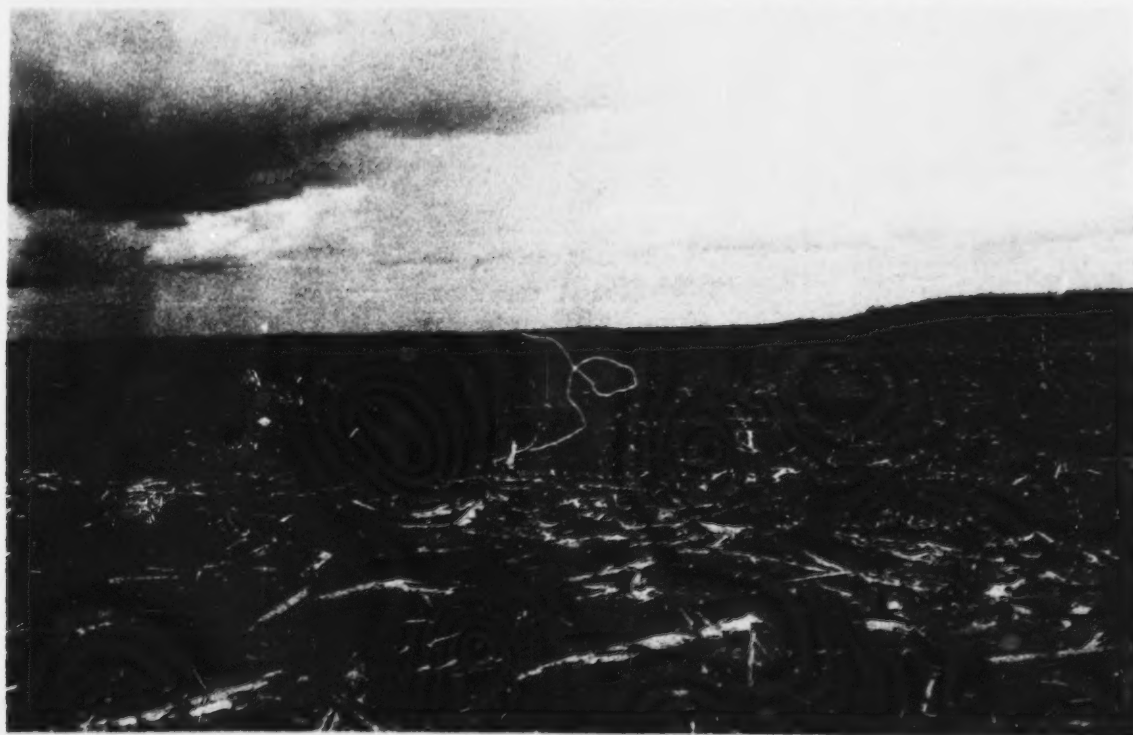


PLATE VIII Bulldozed Clearing at Ominawin Bypass, From Shoreline. UNR00 (2660)

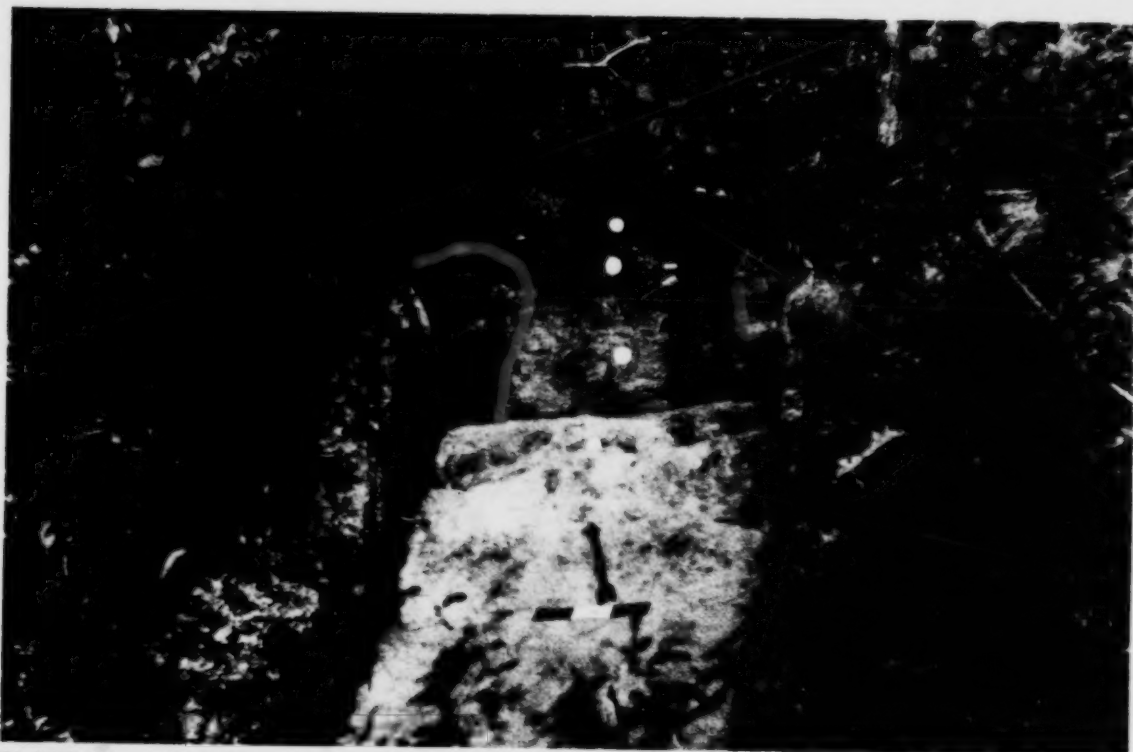


PLATE IX Test Excavation: Test Trench Showing Stratigraphic Record. UNR00 (2722)



PLATE X Test Excavation: Historic Building Structure at Site UNR205. (2800)



PLATE XI Collapsed Cabin at Site UNR204. (2824)

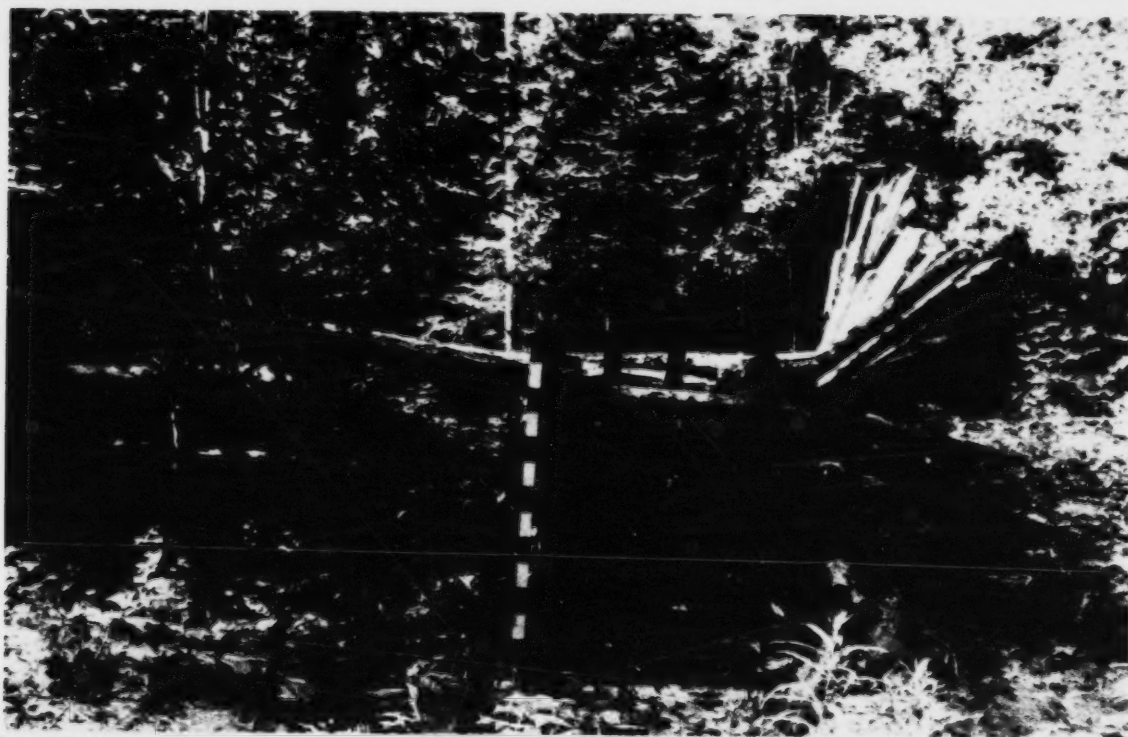


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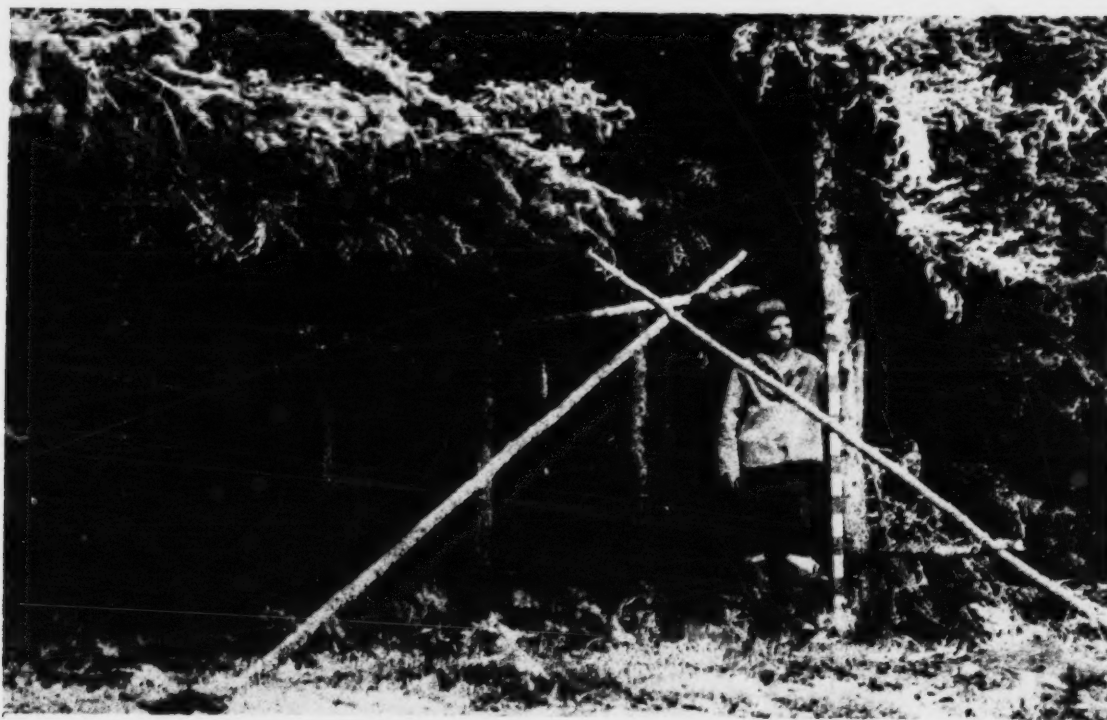


PLATE XIV Tent Frame. UNR00 (2757)

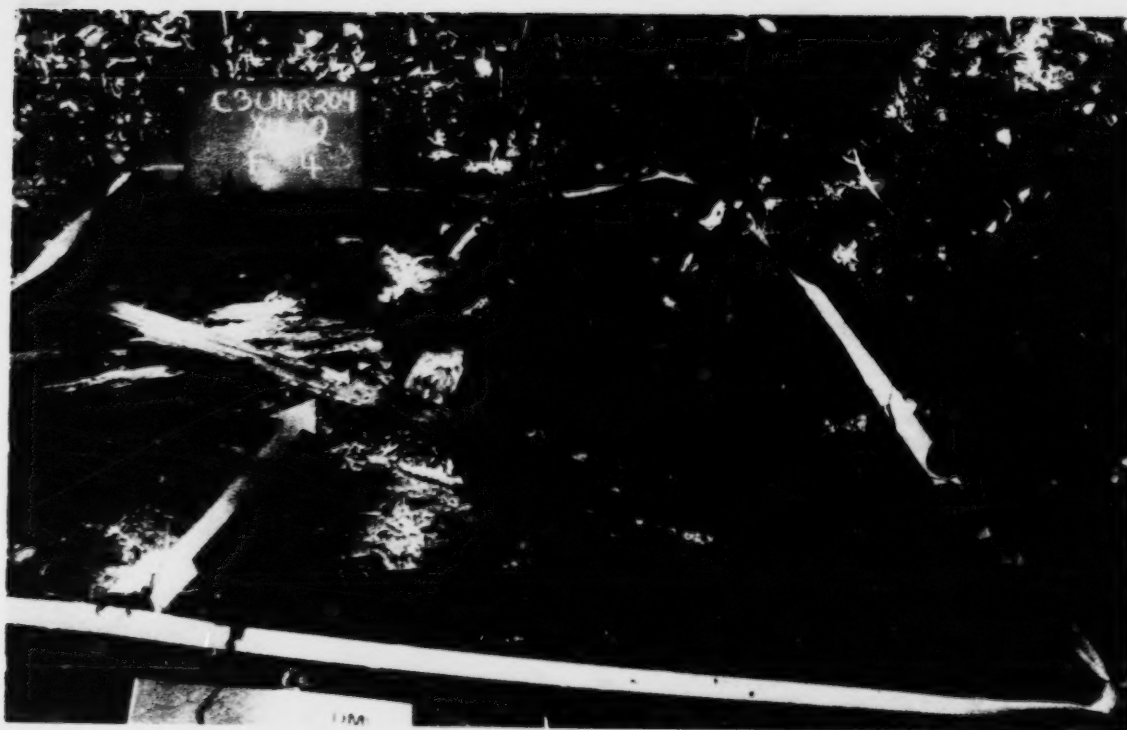


PLATE XV Burial Mound (Historic?) at Site UNR204. (2823)



PLATE XVI View of Norway House I, Warren's Landing. Painted by Peter Rindisbacher, 1821.

APPENDIX 7 - G

AN ASSESSMENT OF THE ARCHAEOLOGICAL RESOURCES
OF THE RAT-BURNWOOD DIVERSION AREA

AN ASSESSMENT OF
THE ARCHAEOLOGICAL RESOURCES
OF THE RAT-BURNWOOD DIVERSION AREA

by

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Churchill Diversion Archaeological Project
Winnipeg, Manitoba
April, 1973

for

THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD

SPECIAL NOTE

THE CONCLUSIONS AND RECOMMENDATIONS CONTAINED IN THIS APPENDIX ARE THOSE OF THE AUTHOR(S) AND ARE NOT NECESSARILY THE SAME AS THE CONCLUSIONS AND RECOMMENDATIONS OF THE LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS STUDY BOARD AS EXPRESSED IN THE SUMMARY REPORT AND THE TECHNICAL REPORT.

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In order to ameliorate the effects of the diversion on archaeological resources along the Rat-Burntwood system the following recommendations are suggested. After having read Section VI, Observations and Conclusions, the following points should be apparent.

1. That approximately 90% of the Cultural History as represented at archaeological sites on the Rat-Burntwood River Systems are in danger of being destroyed as a result of the Rat-Burntwood diversion.
2. That the 1972 Rat-Burntwood Archaeological Project only obtained a very small sample in relation to the sampling universe, defined as the total study area.

Recommendations:

1. In the brief time that remains before the construction of the Notigi control structure, archaeological research ie. large scale excavations should be conducted during the summer of 1973 on UNR23. The site is in close proximity to the Notigi Hydro camp and has already experienced some damage due to modern activity.

2. It is recommended that large scale stripping and excavations be conducted on UNR4 during the 1974 field season. This site is the only documented early trade post on the Rat-Bruntwood drainage system. During the same field season, small-scale excavations should be carried out on UNR43, which is also located on Threepoint Lake. Previous tests suggests that this may be one of the three good stratified sites containing both Initial Woodland and Terminal Woodland components.
3. Recommendations for the 1975 field season call for small but intensive excavations at UNR47, UNR48, UNR50 and UNR52. These four sites are rich in subsurface features which provide information on artifactual contextual associations and run the gamut in time from the Archaic Period to the Early Historic Period. They should yield valuable information on change and continuity of cultural traditions in the Boreal Forest.
4. Intensive survey should be continued along the northern section of the Rat River, especially from Issett Lake to Rat Lake. A few sites, SIL58, 59 and 60 were briefly tested during

the 1971 Rat-Burntwood survey and should be re-tested on a larger scale. The South Bay to Issett Lake portage has a long history of utilization and should be thoroughly surveyed.

5. A trained and experienced archaeologist should be assigned to all major construction activities such as the clearing for and construction of roads. These individuals could assess the magnitude of data loss and conduct some salvage work.

II

OBJECTIVES

The broad objectives of the 1972 Rat-Burntwood Archaeological Survey were:

- 1) to evaluate the archaeological and affiliated natural history resources of the Rat-Burntwood diversion route and
- 2) to assess the effects that the diversion project will have on these resources.

Archaeological resources include the total record of humanity, Indigenous and Euro-Canadian, in the area as represented by prehistoric and historic archaeological sites.

The archaeological objective of the 1972 survey was to obtain a representational sample of archaeological sites within the research zone, to collect information on the nature and size of sites, to collect a sample of artifacts to determine, if possible, the potential antiquity of sites, to collect information on the ecological-environmental setting of sites, and to obtain information on the interrelationship of site location and habitat zone.

In accordance with the Canada-Manitoba Agreement for Lake Winnipeg, Churchill and Nelson Rivers was "to determine the effects that regulation of Lake Winnipeg, diversion from the Churchill River and development of hydro-electric potential

of the Churchill River diversion routes are likely to have on other water and related resources, "(Mallory 1972). The survey's second aim was to evaluate the total effects of the diversion on the archaeological resources, ie. sites along one segment of the diversion route. From controlled observations on site location, site distribution, and site elevation above the 1972 summer water level, a reliable approximation of the impact of the diversion on archaeological resources can be estimated. The effects of the diversion project will be both direct eg. sites being inundated by the impoundment pool or churned-up during the construction of the control structure, and indirect, eg. sites destroyed as a result of slumping or erosion. We need to establish to what degree the archaeological sites will be destroyed by indirect and direct effects.

An Archaeological Perspective

The three basic aims of archaeology are:

- 1) to reconstruct cultural history,
- 2) to reconstruct cultural lifeways, and
- 3) to delineate cultural process

In order that the reader will be able to understand more fully the significance of the data presented in Section VI, Observation and Conclusions, a brief and simplistic discussion of the archaeological method follows.

The initial phases of any archaeological investigation are site survey and controlled excavations. Sites must be located and selected ones excavated to gather carefully controlled data. At the primary level of analysis, the aim is to describe the data according to three dimensions; time, space, and form. The temporal dimension ie. Cultural History, signifies the placing of the various cultural expressions (sites) in a chronological order. There are reliable absolute dating techniques such as the Carbon 14 method to date sites but many times archaeologists rely on a sort of "index fossils" such as pottery types or projectile point types to determine an approximate age. One of the leading authorities on Boreal Forest Prehistory, Dr. James V. Wright (1973), has recently divided the prehistory of the Boreal Forest into four periods:

1. Terminal Woodland A.D. 700-Historic
2. Initial Woodland 600 B.C.-A.D. 700
3. Shield Archaic 4000 B.C.-600 B.C.
4. Early Man 8000 B.C.-4000 B.C.

The second dimension is spatial. Sites must be located in the context of local environment and geography. Also of interest is the distribution of sites in terms of function ie. location of village sites, kill sites, pictograph sites, quarry sites, burial sites, etc.

The third dimension is the formal and this simply refers to the physical characteristics of the material culture of the prehistoric populations. House shapes, cache and fire pits, pottery, scrapers, and projectile points are the basic ingredients with which the archaeologist works.

The reconstruction of the lifeways of extinct peoples is the second aim of archaeology. By controlled survey and excavations and by interpreting the prehistoric data by analogy to living peoples, the archaeologist attempts to reconstruct the economy, political and social organization, trade patterns, and how the prehistoric population adapted to their environment. Since available historical, ethnographic, and archaeological data indicates that we are dealing with nomadic peoples during the majority of the time involved, ie. the last 8,000 years, the Rat-Burntwood System must be viewed as merely one of several areas which the various peoples may have utilized in their perennial round of livelihood activities or may have been using as a navigation route during movements. Arthur J. Ray (1971) illustrates a cyclinal pattern of Boreal Forest occupants (Early-Historic Cree) moving into the Aspen Parkland during the winter to hunt buffalo, then moving back into the Boreal Forest during the other seasons to utilize the lake, streams, and forest for their animal, birds, and fish resources. By looking at the archaeological record, we may determine if this is merely a historic pattern or if this pattern was followed 1,000, 2,000 or 5,000 years ago.

The third aim, the study of Cultural process refers to the dynamic causes and effects operative among prehistoric cultures, and to the processes responsible for changes in the organization and content of the cultures. For example, after the advent of Early Man into the Boreal Forest, there appears to be little change in adaptive strategy until the Historic period. What is the basis of the "cultural conservatism" in the Boreal Forest? What does "Boreal Forest adaptation" imply? What factors permitted the spread and stability of a culture over such a large area?

The answers to these types of questions lie buried under the soils of the northern coniferous forest. More important is the fact that each specific area within a limited part of the Boreal Forest ie. Northern Manitoba, houses part of the data that can answer these questions. Southern Indian Lake, the Rat-Burntwood, the Outlet Lakes System, the lower Nelson River are a few of the areas which house their own particular local prehistory but which all contribute to the understanding of the whole regional prehistoric picture. Each of these sub-areas, is unique in many features, such as proximity to grasslands or fish and game productivity which influenced the local prehistoric populations. In order to eventually not only answer some questions, but to formulate new questions, the specific environmental and cultural data from the Rat-Burntwood, from the Outlet Lakes and from many other specific areas within Manitoba and other provinces, must be correlated and understood on a regional basis.

III

TERMS OF REFERENCE

The proposal submitted by Oscar L. Mallory (1972) for "evaluating human history and affiliated natural history resources of the Nelson River Power Development Area", called for an intensive shoreline survey of five large lakes on the lower Rat and Burntwood Rivers. After consulting with various members of Manitoba Hydro and the Study Board, highest priority for intensive archaeological survey were Notigi Lake, Wapisu Lake, Threepoint Lake, Wuskwatim Lake and Opegano Lake. This limited area will be referred to as the Research Zone of the Study Area.

Briefly there were three terms of reference:

- A) to discover and test selected sites
- B) to assess the effect the diversion will have on archaeological resources and,
- C) to collect site/area specific bio-physical data.

Concomitant to the survey, the proposal called for limited testing of a number of selected sites. Several inter-related factors determined the priority level for site selection:

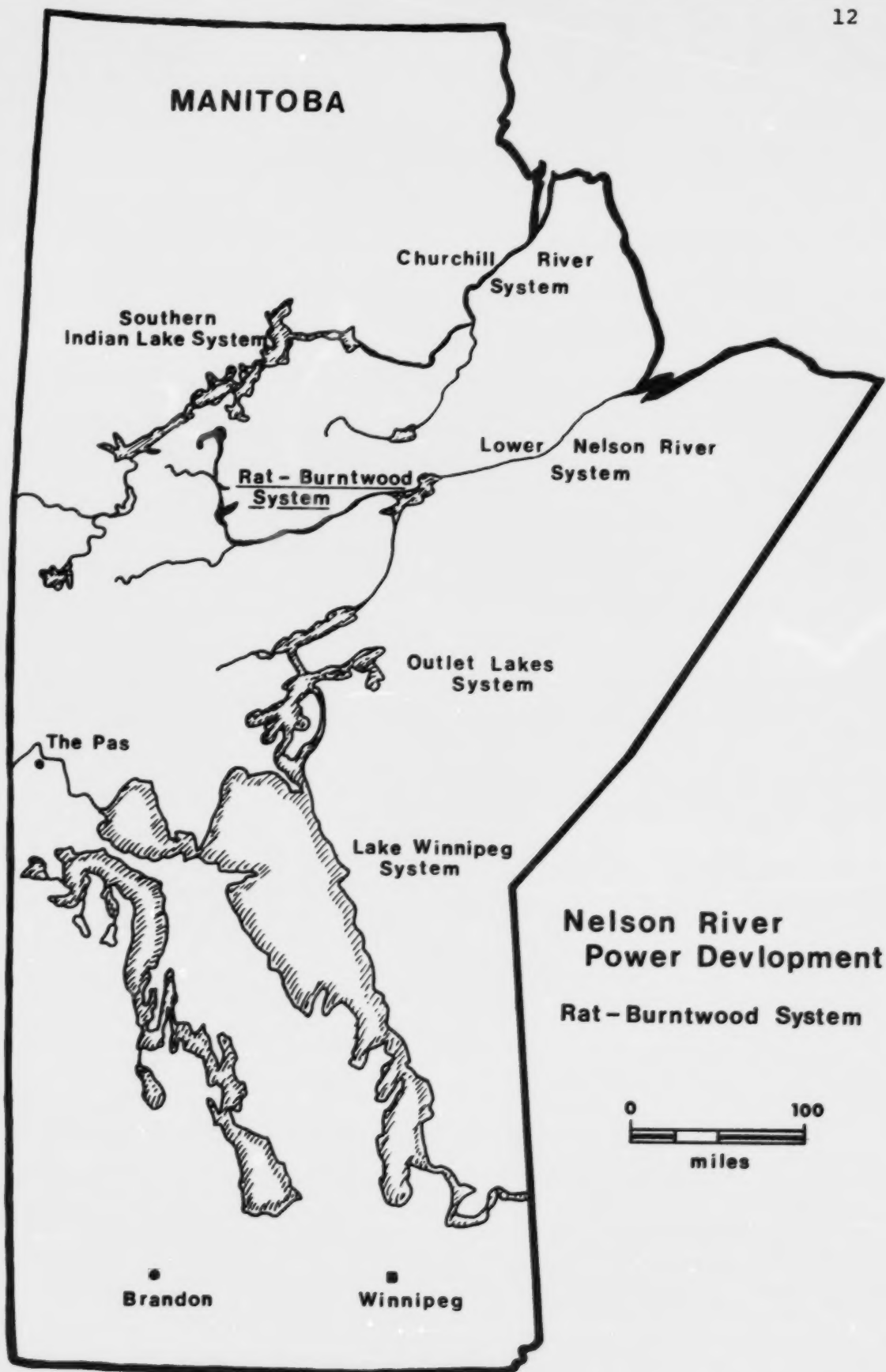
- a) position of site in relation to zone of inundation
- b) degree of natural eroison, soil cover, and undisturbed stratigraphy
- c) type of site and nature of cultural debris

In context of the recovery of archaeological information the aim was to assess the impact effects of the Rat-Burntwood diversion on the archaeological resources of the river and lake system. The overall evaluation of this particular sub-region can be made only after sites have been discovered, excavated, and site location and distribution plotted on large-scale topographic maps.

Complimenting the recovery of archaeological information, the survey strategy also called for the collection of area/site specific environmental data such as local geology, vegetation, and soils.

The total area included in the Rat-Burntwood Study Area includes the entire Rat River system from Issett Lake to Threepoint Lake and the Burntwood River system from Threepoint Lake to Split Lake. This area includes ten major large lakes, two minor lakes, hundreds of miles of interconnecting river shoreline, streams or creeks, and the heterogeneous bush zone behind the shoreline (Map 1). Starting at Issett Lake, where the diversion channel will connect South Bay, the major lakes are: Karsakuwigamau, Pemichigamau, Rat, Misanagu, Notigi, Wapisu, Threepoint, Wuskwatim and Opegano.

The survey research zone within which the archaeological team concentrated their investigations consisted of the two lakes on the lower Rat system, Notigi and Wapisu and the three major lakes on the lower Burntwood System, Threepoint, Wuskwatim, and Opegano Lakes. The area boundaries fall between latitude $52^{\circ}29'$ and $56^{\circ}0'$ North and longitude $98^{\circ}10'$ and $99^{\circ}25'$ East. Within the defined area, (Map 2) the primary zones under consideration were the immediate shoreline and the bush zone behind the shores of the five lakes. Considerable latitude was taken in terms of surveying the bush zone since exact flood levels were vaguely defined, however, at no time was survey conducted outside the area to experience inundation



Map 1: Map of Nelson River Power Development, Rat-Burntwood System.

as outlined on Map 2. Small sections of the actual river channel were investigated, these sections being limited to areas in close proximity to the entrances and exits of the rivers.

Within the research zone there is approximately 255 miles of lacustrine and insular shoreline. However it is estimated that 40% of the total shoreline was effectively and intensively surveyed by the survey team. Table 1 gives the total area of each lake, area surveyed and survey schedule.

TABLE 1

Lake	Area at Shoreline	Survey Area	Schedule
Notigi	39.0	16	June 18-July 5
Wapisu	89.65	40	July 6-July 31
Threepoint	60.78	25	August 1-August 14
Wuskwatim	55.88	23	August 15-August 28
Opegano	10.13	4	September 2-September 4
TOTAL	255.44	108	

Again referring to Map 2, it is obvious that most of the lacustrine and riparian shoreline will be effected by immediate inundation. Within the Study Area the major control structure

will be constructed near the south end of Notigi Lake, slated to be completed by the fall of 1974. The Notigi Lake Control Structure will raise the water level from 794 contour level to the 850 ± 10 foot contour level creating an impoundment pool. The water flow below this structure will hit a seasonal peak of up to 30,000 c.f.s., an increase of 750% from what it is presently. However, the flow may be reduced considerably during the summer months.

Much of the immediate shoreline of Wapisu Lake will experience flooding or erosional alternation as a result of the Notigi structure. The current water level is around the 780 foot contour level and will experience flooding to the 813 contour level. The erosional effects of the increased volume and fluctuating velocity of the discharge may in fact be more severe than the flooding on Wapisu Lake.

The shallow, swampy Threepoint Lake will also experience considerable flooding. The water level will rise from the 780 contour level to the 812 ± 10 contour level.

The construction of the Wuskwatim control structure at Taskinigup Falls is still in the early planning phase and may not be completed until the late 1980's. The anticipated rise in water level will be from the 755 contour level to the 810 contour level.

Opegano Lake will experience some flooding and erosion of its steep clay shoreline.

The above information on flood limits was supplied by Manitoba Hydro. The predicted contour levels are based on open-water conditions.

The survey strategy outlined for the 1972 Rat-Burntwood archaeological reconnaissance called for an intensive survey of the actual shoreline and bush zone behind the shore and the testing (limited excavation) of selected sites. The main factor permitting this intensive survey was the financial support by the Lake Winnipeg, Churchill, and Nelson Rivers Basin Study Board. The large-scale funding made it possible for the Churchill Diversion Archaeological Project to field an eleven man crew, which incidently, proved to be the minimal crew size needed to conduct a proper intensive archaeological survey. The crew was composed of an archaeologist (crew chief), one archaeological assistant, one guide, one full-time cook, and seven students. Students were selected on the basis of their specific knowledge and field experience in related scientific fields such as soil science, geology, botany, photography, ham radio operator, and archaeological field experince.

Site survey in the Boreal Forest presents, in addition to the usual problems, difficulties not encountered in more arid environments. It follows that research strategies particularly in terms of working methodologies and techniques must me adopted to Boreal forest conditions. Unlike the more arid or semi-arid areas of North America, where the

archaeologist can locate sites and get a good representational sample of the prehistoric cultural material by conducting a surface survey within a study area, the northern coniferous forest has a dense tree cover and has a thick mantle of moss overlying its poorly developed soils. There are no prehistoric supra-surface structures such as stone houses or mounds defining site loci. Furthermore, there is generally only a relatively thin veneer of cultural debris represented at sites and site size is rather small. Archaeological sites are more difficult to locate in the Boreal Forest.

The typical response to survey, the surface survey, whereby the surveyor investigates the surface collecting pottery, arrowheads, scrapers, knives and flakes is not an adequate sampling technique in the Boreal Forest. Most surface surveys, along the shores of lakes or rivers, or in the back bush will produce only modern or very late historic debris. In many northern forested regions of Canada, there is a trend to conduct beach surface surveys, almost totally neglecting the bush zone behind the shore. This reliance on surface investigations of mud and sand beaches generally produces a meager amount of artifacts and produces an exceedingly biased sample. Needless to say, this type of small-scale survey only samples one or two habitats in an ecosystem that has a large number of habitats.

Although all five lakes within the study area are located on the Precambrian Shield and share macro-similarities, all five differ to some degree in size, outline, topography, shore types, hydrology and geology. Basically there are twelve major shoreline and bush habitats within the study area, they are listed below.

- (1) sheer cliff
- (2) sand beach (Plate I)
- (3) beach
- (4) high bare outcrop-open vegetation
- (5) low hinterland - dense vegetation
- (6) lacustrine low marsh - poor drainage
- (7) low ground, moderately open-well drained
- (8) swampy creek (Plate II)
- (9) steep-high clay banks (Plate III)
- (10) shore-edge, low outcrops, open bush (Plate IV)
- (11) low clay banks, dense spruce (riverine)
- (12) high ground, low outcrop

Figure 1 graphically represents a cross-section of the twelve different zones. All five lakes have different frequencies of these zones and may lack a number of them.

The major physiographic features of the different lakes are also important and include:

- (1) long penninsulas
- (2) small points
- (3) islands
- (4) river entrances
- (5) river exits

Various Shoreline Habitation Zones

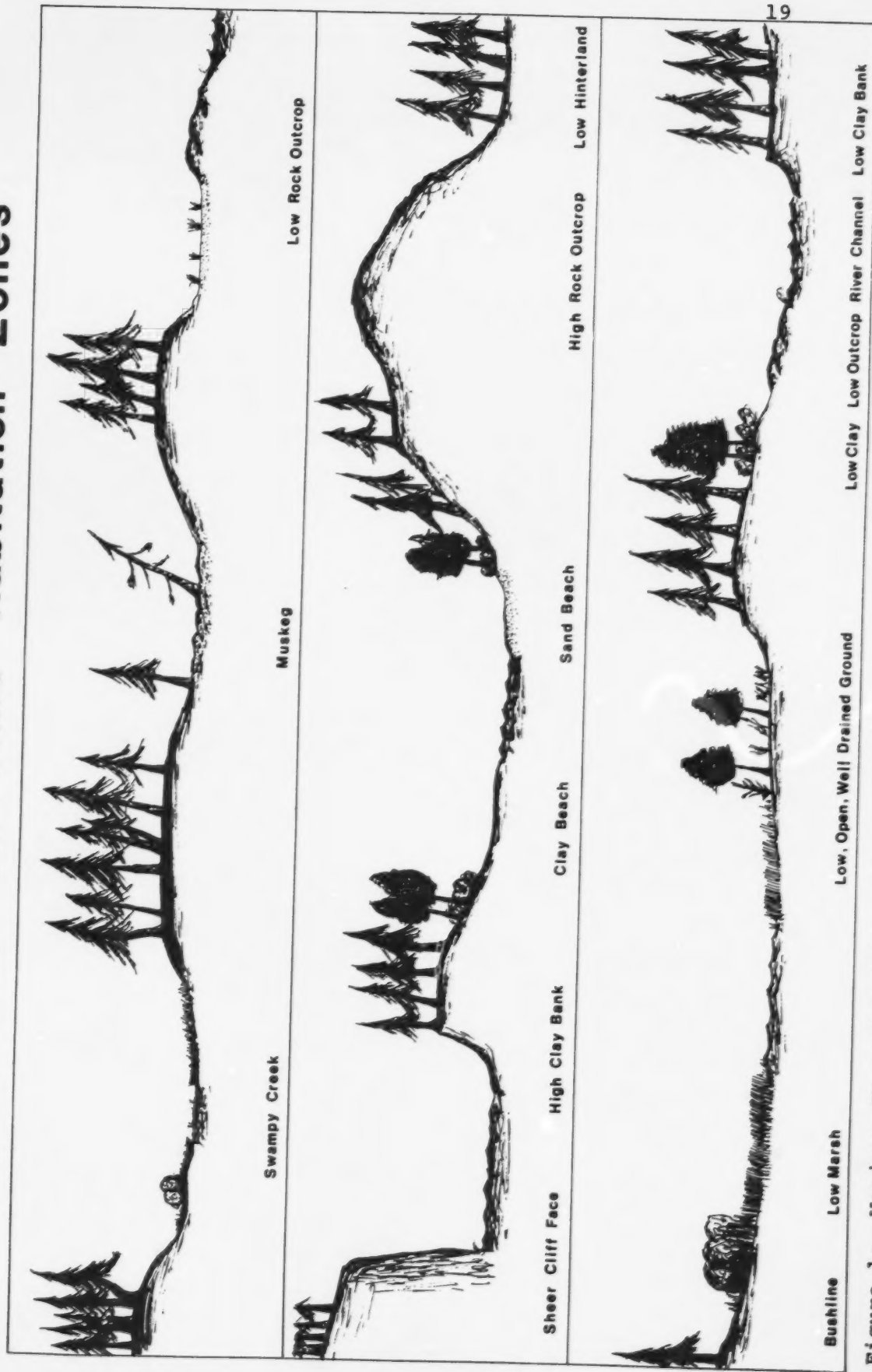


Figure 1: Various Shoreline Habitation Zones.

- (6) straits
- (7) bays
- (8) channel (riverine)
- (9) rapids (riverine)
- (10) straight shore

Appendix A gives the distribution of the 52 recorded sites of which 32 (UNR) yielded variable quantities of data and 20 were isolated sites of random past human activities. Although the latter type of site is represented by one or two isolated artifacts, they must, nevertheless, be considered a site. All the random find sites recorded during the 1972 survey were single artifacts found on the surfaces of outcrops or beaches. Appendices B and C only consider the data from sites designated as UNR sites.

The 1972 research plans called for an intensive survey of the different habitats that comprise the bush zone immediately behind the shoreline. Realizing that a surface survey was not a viable working tool in the environment, our methodology called for examining all potential site loci utilizing a series of randomly placed test pits within the potential site area as a test for evidence of prehistoric occupation. Because of the number of trees and roots, test pits were kept small (1m. x 1m.) and closely spaced as feasible to give a proportional examination of the ground surface. Once archaeological evidence was discovered it was then decided the extent of further testing necessary to establish site dimensions, condition and quality.

In this manner, the 1972 survey team literally tested hundreds of potential sites in all types of biophysical zones. Hundreds of beaches were thoroughly investigated as well as sheer cliff faces for pictograph sites, and high bare outcrops for lithic quarry sites. The dense, swampy creeks and other zones were investigated with varying intensities. The critical limiting factor in terms of degrees of survey intensity was Time since the figure of 255.44 miles of shoreline does not account for the survey in the bush zone behind the shore.

A tremendous aid in the initial phase of our investigation was an aerial reconnaissance of the complete research zone. This was made possible by Dr. John Clake, the Dean of Arts and Sciences, University of Winnipeg. Before our survey began we had a good birds'-eye view of the nature of the area with which we were dealing. The technique of air survey is a very valuable survey tool for the Boreal Forest archaeologist.

Site survey methods and techniques are inter-related with archaeological theory and the particular problems that the archaeologist is investigating. The inter-relationship of our working methodology and our objectives in context of salvage archaeology is discussed in Section II, Objective.

Introduction

During the 1972 Rat-Burntwood survey thirty-two archaeological sites (UNR) were recorded. In addition to these sites, twenty "Random Finds" were also discovered, these representing single, isolated artifacts such as scraper or flake found on the surface of the shoreline. Appendix A gives the distribution of the 32 sites and 20 "Random Finds" by shoreline types and physiographic features of the lakes. Appendix B is a synoptic chart containing pertinent data regarding the thirty-two UNR sites.

In terms of characteristics, sites recorded during the 1972 survey range from a few sherds and stone tools scattered about sand beaches to village sites containing a great number of sub-surface features such as fireplaces (Plate V-VI), post molds (Plate VII) and which also yielded a good artifactual sample. Of the 32 UNR sites, only three are open surface sites located on sand beaches. The remaining sites, except for UNR53, were tested with varying degrees of intensity.

Survey Sample of Research Zone

The quantity and significance of the cultural debris and information collected during the 1972 Rat-Burntwood survey surpassed all survey results of previous years. This was due to the fact that many sites were tested by a large number of

people. For example, 40 projectile points came from this survey while only 15 were represented in collections obtained during the 1969-71 survey of Southern Indian Lake (Dickson 1972). Scrapers and other classes of stone artifacts were numerous as was pottery. Moreover, very few prehistoric and/or historic sub-surface firepits (features) came from other surveys (Wiersum 1972) in the area while the 1972 survey mapped and excavated many of these. Often these features contained several classes of artifacts in the pit fill. The contextual information is important to the archaeologist. Features at some sites (UNR28, 47, 52) contained native pottery, arrowheads, European trade beads, and trade pipes. These obviously represented Early Historic sites since the native population had not lost their indigenous ceramics and tool traditions.

One site that is unique to Manitoba is a native Cree dancing circle, or a religious ceremonial site (Plate VIII and IX). Another site UNR4, is believed to be an early European winter trading post since one section of the site has native pottery, arrowheads, and scrapers while the other part contained metal tools and bee-hive shaped stone ovens (Plate X). McGillivray's (1789-90) Rat River Fort Journal states that a Northwest Coast trading post was located on the southwest point of Threepoint Lake, the exact location of UNR4. These types of sites cannot only yield valuable information on the Early Historic contact period, but certainly have potential for recreational development.

Archaeological information collected during the rapid 1971 Rat-Burntwood survey (22 sites, 12 Random Finds) suggested that the major movement of population into the area occurred during the Terminal Woodland Period or sometime after A.D. 700. However this survey was conducted by a two-man team from Issett Lake to Split Lake. Only about 4 miles of shoreline was surveyed in a total of 353 miles of riverine shoreline. (This figure does not include Lake shoreline mileage). The total lake shoreline within the 1972 research zone approximates 255 miles and it is estimated that 40% or 102 miles was thoroughly surveyed. By intensifying the survey, both in terms of personnel and the reduction of area size, a more representational sample of the chronological cultural units was obtained.

Two projectile point fragments recovered during the 1972 survey are the only evidence suggesting a penetration of population into the area during the Early Man Period. Both these sites were located on islands. Sites representing this time period may in fact be located on higher beach terraces further back in the bush. UNR50 and possible firepits discovered in the lower levels of UNR23 may represent two Archaic Period sites. On the basis of only a small lithic tool sample, it is difficult to date Archaic Period sites since many lithic tool classes are non-diagnostic.

Previous surveys this far north produced little evidence of Initial Woodland sites (Hlady 1971: Wright 1968). Some scholars have postulated that the ceramic decorative attributes,

typical of this period had diffused into the northern coniferous forest from Asia (Wright 1967). Other archaeologists (Wright 1973) now propose some unknown southern origin for the Initial Woodland Ceramic Tradition. The 1972 survey produced six sites containing pottery assignable to the Initial Woodland Period. Two of the six sites (UNR23 and UNR26) produced many subsurface features and a good pottery and lithic sample. These two sites are the most northern Initial Woodland sites recorded in Manitoba. The other good Initial Period site, UNR43, may be a good stratified site. The remaining sixteen sites are assigned to the Terminal Woodland Period and assigned on the basis of pottery to the Clearwater Lake Phase of this period. Several archaeologists (Wright 1968; Haldy 1971) attribute this phase A.D. 1000 - Early Historic Period) to the Cree speaking people. The archaeological evidence supplemented with early historic accounts now suggests a complex migratory/subsistence pattern of the Native Cree who exploited far-flung ecosystems on a regular seasonal basis (Ray 1971).

Table 2 gives the distribution of the sites by time period.

TABLE 2

Period	Date	Components
Recent	Cree	2
Early Historic	Post 1690	5
Terminal Woodland	A.D. 1000 - 1690	16
Initial Woodland	600 B.C. - A.D. 700	6
Archaic	4000 B.C. - 600 B.C.	2
Early Man	8000 B.C. - 4000 B.C.	2

Although a large quantity of the cultural material recovered during the 1972 survey has not been completely analyzed as yet, a few tentative statements can be made concerning site function and site size.

For most part, sites were small, the majority representing transient camp sites or wind stops. Several of the small sites (UNR35) have subsurface firepits suggesting cooking activities as well as artifacts reflecting hide-processing activities and hunting activities. Sites such as UNR23, UNR26, and UNR48 appear to be larger, seasonal habitation sites. The bone preservation at UNR23 was good and is now in the process of being identified. This should yield information on the seasonal occupation of the site and the diet of the people. Since

excavations were limited, an accurate estimate of the site size is rough although the Notigi hydro camp is definitely built on top of part of UNR23.

One would expect to find a great many types of functional sites ie. kill sites, pictograph sites, village sites, quarry sites etcetera, and in some ways our control of beach types and physiographic lake features points to site function differences and site location preferences.

Although the main focus of the 1972 survey was on the human history evaluation, a secondary objective was to collect ecological environmental data which would yield significant information on the dynamic cultural history within one localized environmental setting of the Boreal Forest. The following types of environmental information was collected:

- 1) A complete collection of the dominant vegetation on certain sites was taken, processed and now being analyzed.
- 2) Many dozens of soil samples were taken to determine the phosphorous content which may give insights into site boundaries and intensities of occupation.
- 3) Soil samples could be studied to determine the minerology of soils, soil chemistry and trace element analysis.

- 4) A pollen sample was taken from bog near UNR23.
- 5) Bone and charcoal samples taken from features to get absolute C¹⁴ dates.
- 6) Bone preservation was much better than anticipated which should yield information on Paleodiet and fauna.

Environmental Account

The environmental account can be analyzed in terms of the entire Rat-Burntwood diversion. An individual structure might destroy one site, or the impoundment pool a number of sites, but the entire shoreline of the Rat-Burntwood represents a regional record of various peoples. The entire settlement pattern of various periods, the intra-site activities, and the specialized activity areas, eg. stone quarries and religious sites (pictograph) will be partly or totally destroyed.

The natural erosion of archaeological sites is a slow continuous process. However, the actual construction of dams, hydro camps, roads, the creation of impoundment pools, and fluctuating water levels and volume can destroy hundreds of archaeological sites in a very short time. The prehistory of whole regions can literally be destroyed. Our accumulative data on some 250 sites in the region suggests that 90% of all sites are no more than 10 feet above the current water

levels. If May 2 is at all accurate in terms of flood limits, all sites recorded during the 1972 survey will be inundated or at least experience severe erosion. A conservative estimate would be 4 or 5% of the sites in the total Rat-Burntwood System will escape all effects of the diversion.

It was calculated the entire shoreline of the Rat-Burntwood System to have 837 miles of riverine, insular, and lacustrine shoreline of which 4 miles was intensively surveyed during the 1971 Rat-Burntwood survey and 102 miles were intensively surveyed during the 1972 survey. Both surveys produced 54 archaeological sites and 32 Random Finds (which have to be called a site in the strictest sense since it does define a unit of human activity). Therefore if 12% of the entire river system produced 86 sites then the complete river system, as the sample universe should house more than 690 sites. A 12% sample is indeed, a small sample in archaeological terms as Kelly's (1972) Outlet Lakes survey demanded a 20% sample size.

In terms of our research universe, all thirty-two (UNR) sites will be effected by one or several destructive agents related to the diversion. One of the most important and productive sites, UNR23 will be destroyed by activity around the Notigi Hydro camp or be buried under 40 feet of water. UNR4, the productive, North West Company trading post on Three-point Lake is situated on both low and higher ground (0-15 ft).

This site too will be destroyed. The other High Priority sites, UNR26, UNR43, UNR47, UNR48, UNR50, UNR52, and UNR53, all will be flooded or destroyed by the creation of a new shoreline. Appendix C lists site priorities. Table 3 gives the distribution of sites by elevation above water level. Appendix D presents a detailed site description of A priority sites.

TABLE 3

Elevation	Number of Sites
0 - 15 ft.	3
0 - 10 ft.	19
0 - 15 ft.	5
0 - 20 ft.	5

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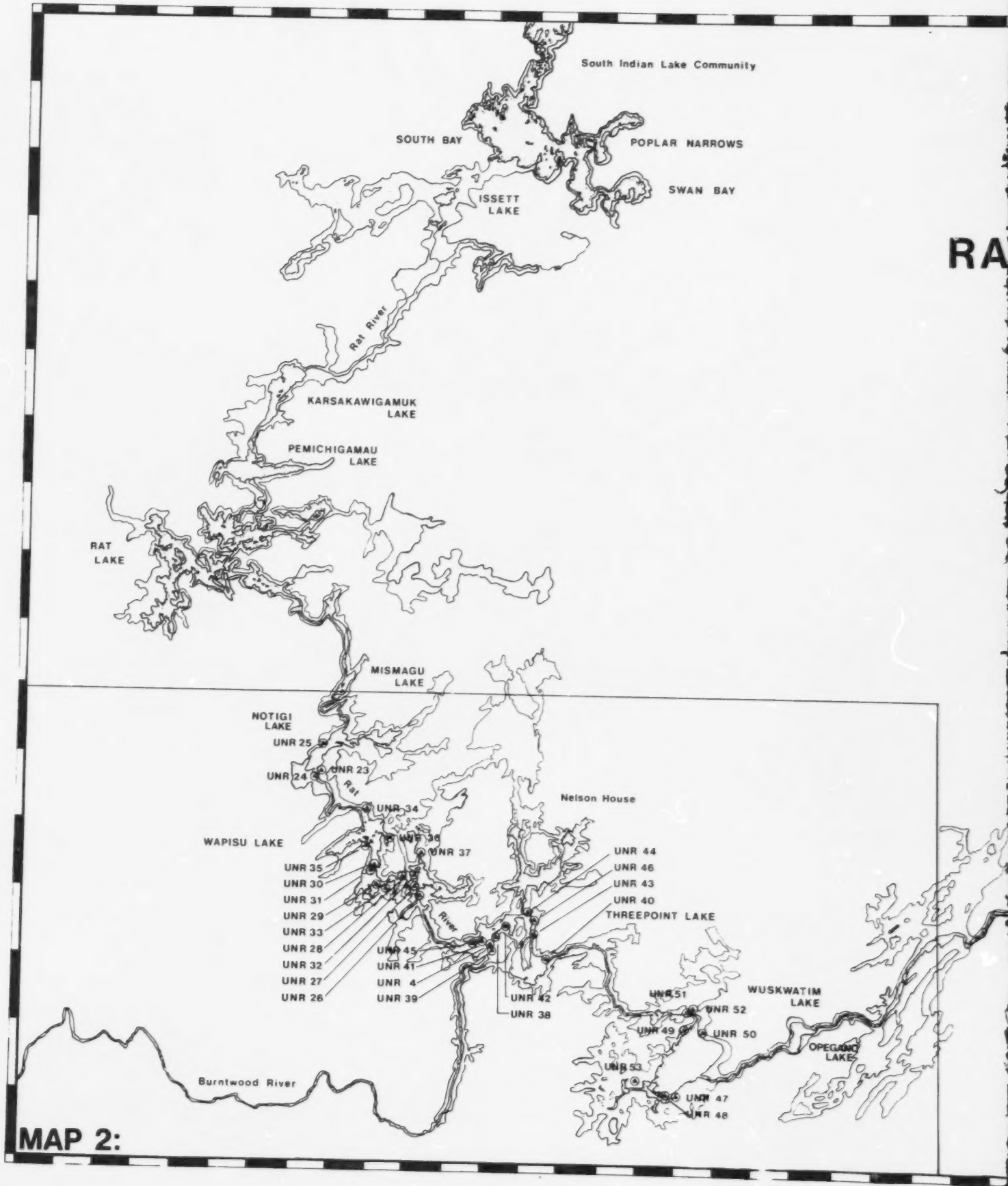
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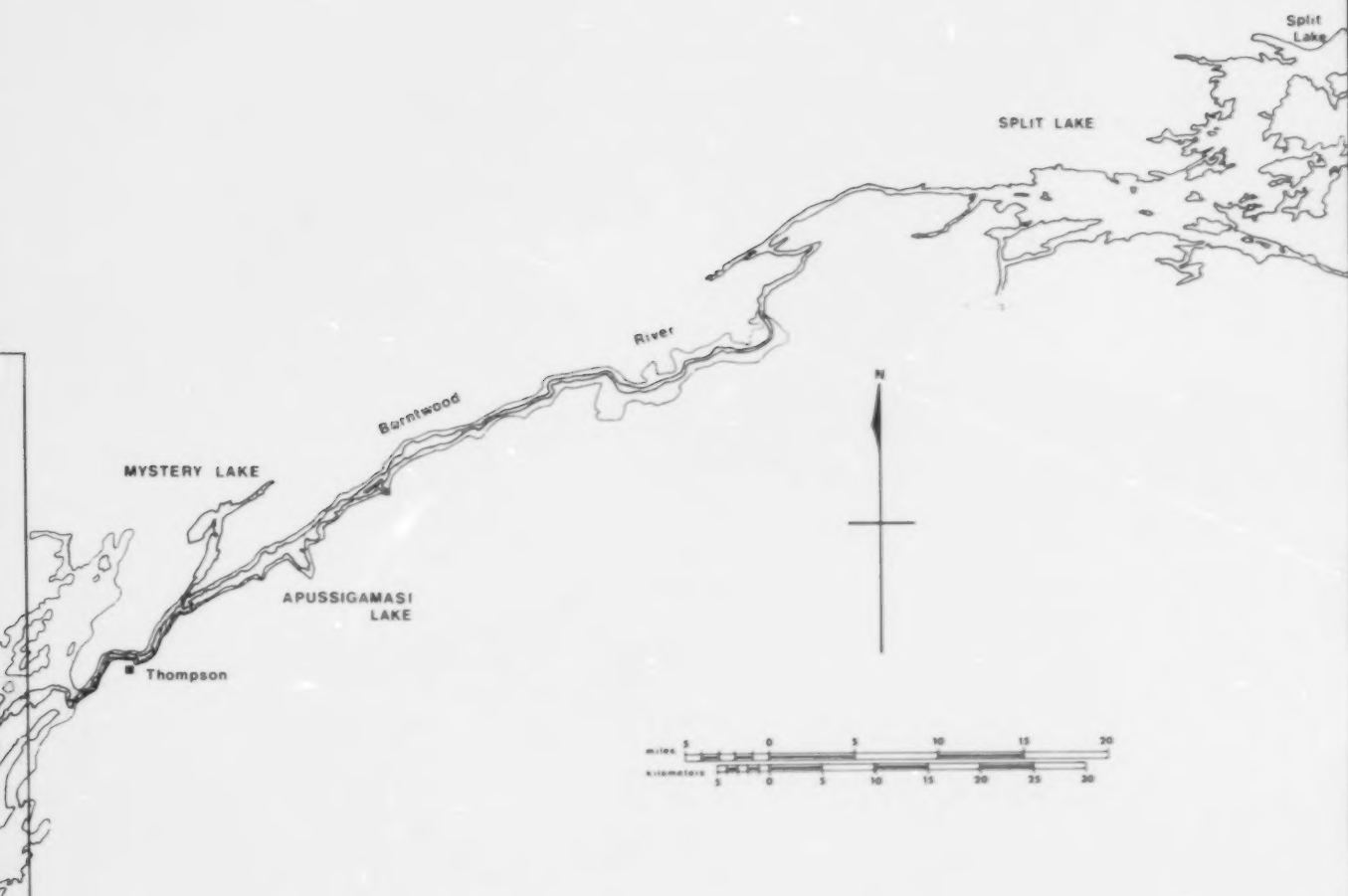


MAP 2:

RAT - BURNTWOOD SYSTEM

Including 1972 Research Zone & Sites

Showing Area to be Flooded



APPENDIX A

Shore Habitat	Physiography	Long Peninsulas	Small Points	Islands	River Exits - Entrances	Straits	Bays	River Channels	Portages	Straight Shores	TOTAL
Sheer Cliff											0
Sand Beach				6			2				8
Clay Beach		3									3
High-Open Outcrop										1	1
Low-Closed Hinterland Forest									1		1
Marsh											0
Low Bank - Well Drained - Open			3		1						4
Creek							1				1
Steep - High Clay Bank						1					1
Low Outcrop Shore Edge		1	9	3	7	5	1	3		3	32
Low Clay Bank Dense Forest											0
High Ground Low-Outcrop		1									1
TOTAL		5	12	9	8	6	4	3	1	4	52

APPENDIX B

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SITE	LOCATION	CULTURAL IDENTITY	SOILS	VEGETATION	EROSION	TOPOGRAPHIC
UNR23	Notigi	Historic - Initial Woodland	humus sand	open (shrub)	light	river debouchment
UNR24	Notigi	Historic-Terminal Woodland	humus/silt/clay	open (shrub); man's modification	light	river debouchment
UNR25	Notigi	Terminal Woodland	humus/sand	open (grass); small aspen	light	lake shore
UNR26	Wapisu	Historic-Terminal Woodland; Initial Woodland	slumping clay	spruce with aspen	heavy	river debouchment
UNR27	Wapisu	unknown	unconsolidated sand	open (beach)	heavy	island
UNR28	Wapisu	Historic-Initial Woodland	humus/silt/clay	secondary deciduous forest	medium	mouth of narrows
UNR29	Wapisu	Recent-Terminal Woodland (?)	humus/clay	open (grass); isolated fir	light - medium	point of peninsula
UNR30	Wapisu	Terminal Woodland	humus/silt/clay	grass; sparse shrubs	medium	island point
UNR31	Wapisu	Terminal Woodland	silt/clay	grass; sparse willow	very heavy	island point
UNR32	Wapisu	Terminal Woodland	humus/clay	mature pine; aspen grass	medium	point of peninsula
UNR33	Wapisu	Terminal Woodland	silt/clay	grass; sparse willow	medium	bay - point

APPENDIX B

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SITE	LOCATION	CULTURAL IDENTITY	SOILS	VEGETATION	EROSION	TOPOGRAPHIC
UNR34	Wapisu	Terminal Woodland	silt/clay	grass	heavy	point
UNR35	Wapisu	Terminal Woodland	silt	grass	heavy	point
UNR36	Wapisu	Terminal Woodland	silt	aspen; sparse shrubs	light	point
UNR37	Wapisu	unknown	sand	open	heavy	creek mouth
UNR4	Threepoint	historic-Northwest Co. post	humus/clay	climax pine forest	medium	point of peninsula
UNR38	Threepoint	Terminal Woodland	sand	open	heavy	tip of island
UNR39	Threepoint	Terminal Woodland	humus/silt	-		peninsula
UNR40	Threepoint	Terminal Woodland	humus/clay	aspen; birch	medium	river exit
UNR41	Threepoint	Early Man - Historic	silt	open (grass)	heavy	tip of island
UNR42	Threepoint	Historic, Terminal Woodland	humus/silt	open (grass)	medium	tip of island
UNR43	Threepoint	unknown	sand/clay	secondary bush; recent forest fire	heavy	point
UNR44	Threepoint	Late Historic, Early Nelson House	humus/clay	open (grass)	heavy	channel mouth
UNR45	Threepoint	unknown	beach	open	heavy	point
UNR46	Threepoint	unknown	humus/clay	marsh; sparse shrubs	heavy	point

APPENDIX B

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SITE	LOCATION	CULTURAL IDENTITY	SOILS	VEGETATION	EROSION	TOPOGRAPHIC
UNR47	Wuskwa'im	Terminal Woodland, Early Historic	silt/clay	marsh; shrub	medium	point
UNR48	Wuskwa'im	Historic, Initial Woodland Archaic?	humus/silt	grass; shrub	heavy	point of peninsula
UNR49	Wuskwa'im	Historic, Terminal Woodland	humus/silt	willow; grass	light	point
UNR50	Wuskwa'im	Terminal Woodland, Archaic	humus/silt	spruce forest	light-medium	point
UNR51	Burntwood River	Terminal Woodland	humus/silt	open grass	medium	river island
UNR52	Burntwood River	Early Historic	humus/silt	open grass	medium	river island
UNR53	Wuskwa'im	Cree dancing circle	humus	spruce	light	forest

APPENDIX C

SITE	LOCATION	ELEV. (feet)	SITE PRIORITY
UNR23	Notigi	0 - 10	A+
UNR24	Notigi	0 - 10	C
UNR25	Notigi	0 - 10	D
UNR26	Wapisu	5 - 15	B+
UNR27	Wapisu	0 - 10	D
UNR28	Wapisu	5 - 25	C
UNR29	Wapisu	0 - 10	D
UNR30	Wapisu	0 - 5	C
UNR31	Wapisu	0 - 5	C
UNR32	Wapisu	10 - 15	C
UNR33	Wapisu	0 - 10	B
UNR34	Wapisu	0 - 10	C
UNR35	Wapisu	0 - 10	D
UNR36	Wapisu	0 - 10	D
UNR37	Wapisu	0 - 10	C
UNR38	Threepoint	0 - 15	D
UNR39	Threepoint	0 - 10	C
UNR4	Threepoint	0 - 15	A
UNR40	Threepoint	0 - 15	B
UNR41	Threepoint	0 - 7	D
UNR42	Threepoint	0 - 15	C
UNR43	Threepoint	0 - 15	A-
UNR44	Threepoint	0 - 15	D
UNR45	Threepoint	0 - 5	B
UNR46	Threepoint	0 - 20	C
UNR47	Wuskwatim	0 - 10	A
UNR48	Wuskwatim	0 - 20	A
UNR49	Wuskwatim	0 - 10	C
UNR50	Wuskwatim	0 - 20	A
UNR51	Wuskwatim	0 - 10	C
UNR52	Wuskwatim	0 - 10	A
UNR53	Wuskwatim	-	A

APPENDIX D
DESCRIPTION OF A PRIORITY UNR SITES

Site No: UNR4

Priority: A

Location: Threepoint Lake; Lat. $55^{\circ} 41' 45''$ Long. $98^{\circ} 59' 0''$

Description: The site area is located on the end of a long point located on the southwest shore of Threepoint Lake. Along the shoreline the relief is low outcrop and mud flat. The point behind this low flat area rises steeply forming to the central part of the peninsula. The low areas are covered with water until July and is covered with willow, grass and low bush. A mature Black Spruce forest and thick mantle of moss covers the high, main part of the peninsula. David K. Riddle discovered the site during his 1971 survey (Wiersum 1971). Because of a higher water level he tested the east section of the site. During the 1972 survey the low mud flat on the western side of the tip was tested (Test Units A-F) as well as the high area approximately 100 meters back in the Black Spruce forest (Test Units G-J). There were four collapsed stone and mortar structures in the area, heavily overgrown, which may represent bee-hive shaped ovens (Plate X). Besides a few small depressions in the same vicinity there was no other evidence of recent or earlier occupation.

According to early historic documents (McGillivray 1789-90) there was a North West Company post (1789-94) situated on a point along the southwest shore of Threepoint. Cultural material recovered during the 1972 survey, arrowheads, pottery, trade pipes, flint locks, porcelain, metal knives, and the ovens strongly suggests that this is the locus of the trading post.

Stratigraphy: The stratigraphy on the lower part of the site was mixed due to wave action. Generally there was 10 cms. to 15 cms. of black to brown silt mixed with small rounded pebbles present throughout the deposit. The silt overlaid basal clay or bedrock. Fine sand lenses were present in the upper part of the stratigraphy. Some units were excavated in two levels (0-10 cms.; 10-15 cms.). Modern debris such as shot gun shells were found in basal layers with pottery.

The "ideal" stratigraphy of the upper section of the site (area 2) was a thick layer of humus 27 cms. over clay. The clay except for intrusive archaeological features was sterile. The cultural debris represented at this section was found under or in the moss.

Elevation: 0-15 feet above summer water level.

Site No.: UNR23

Priority: A

Location: Notigi Lake; Lat. $56^{\circ} 54' 22''$ Long. $99^{\circ} 22' 55''$

Site Description: The site occurs on a broad, low, peninsula at the debouchment of the Rat River and Notigi Lake. Approximate dimensions of the site are 60-80 meters wide. The Hydro camp is situated along the lake shoreline to the north. The area of the site itself showed extensive recent utilization and was the site of the helicopter landing platform. The relief of the peninsula is very low, with a swamp in the south and northwest. Flora is of

secondary nature as this whole area was recently cleared by Manitoba Hydro.

Typical vegetation consists of alder, willows, aspen groves, birch, dogwood, and grass.

Soils: Soil displays characteristics common to Orthnic Podzol profile: LH, Ac, Bf, or Bfh, C:

LH horizon - contains surface layer of leaves, needles and organic matter in various stages of decomposition.

Ac horizon - light colored, light grey, weak grade and predominantly sand (less than 15% clay). Moderately acid in reaction.

B horizon - more reddish in color than A or C horizon. High accumulation of iron (Bf). Clay absent. Moderately acid in reaction and consistency is O, loose grain.

CK1 horizon - varying up to 30 cm. of Kaolinite clay mixed with small amount of silt. Consistency firm; mild acid reaction 5.5 - 6 Ph., cubic-shaped soil aggregates.

CK2 horizon - thick (up to 190 cm.) of varved clay, with alternating light and dark bands. Soil aggregates in the form of horizontal plates; consistency - very firm. Strong Ph. reaction (1.5). The light coloured summer varves react strongly to HCL acid, while the dark-coloured winter varves react only mildly.

Bedrock: Bedrock underlying the CK1 or CK2 horizon is in quartz-biotite gneiss evidencing a low grade of metamorphism. Bedrock varied in depth to 200 cm. at southeast section of area to exposed at south part of site.

Stratigraphy: Generally, the stratigraphy of the cultural bearing deposits at UNR23 was simple. The LH horizon was followed by a thin layer of leached greyish coarse sand with thicker Bf horizon; a coarse sand reddish brown in color. However a great number of micro-ash lenses are found in all horizons, Ah, AE and Bf as well as distinctive features, such as post moulds and firepits. Many of the thin ash lense may represent ash spills over a large area.

Drainage: Well drained, sloping southwest into Notigi Lake (2-5% slope). Local depressions where bog conditions occur.

Elevation: 0-10 feet above summer water level.

Cultural Remains: A great many sub-surface features ie., firepits, post moulds, etcetera, were recorded at the site. The bone material from the features is now being analyzed. The ceramics and lithic assemblages suggest the site may have been first occupied during the late Shield Archaic Period. However, the dominant occupation was during the Initial Woodland Period. Such artifacts as flint locks, triangular arrowheads and Terminal Woodland ceramics suggests a brief occupation during the Early Historic Period.

Complimentary Environmental Samples: A complete botanical collection was made from on site and immediate area. A large number of soil samples were taken from the site and surrounding area. Samples for flotation were also taken and carbon samples were taken for eventual C14 processing. A pollen sample was taken from a cut in the bog on the southeast end of the site.

Site No.: UNR43

Priority: A-

Location: Threepoint Lake; Lat. $55^{\circ} 41' 33''$ Long. $98^{\circ} 46' 40''$

Site Description: Site is located on the East shore of Threepoint Lake midway between the exit of the Burntwood River and Footprint Lake Channel. The site is situated on a terrace behind a series of low outcrops. Test units placed on the higher terrace yielded a good sample of lithic and ceramic debris. No cultural debris was found on the surface of a small clay and sand beach immediately to the north of the area. The slope behind the low outcrop rises sharply at a 55° angle. A great deal of modern cultural refuse was scattered about the whole area. According to local informants, a fish camp was located here a few years ago.

Vegetation: The whole east shore has a secondary vegetation due to a recent forest fire. The dominant vegetation were grasses, alder, willow, poplar and aspen. The higher areas was generally open due to recent fishing activities.

Stratigraphy: A thick humic horizon (0-10 cms.) over a light brown, nuggety clay (11-28 cms.). There was a thin light grey clay lense at the interface of the humus and brown clay.

Cultural Debris: The cultural debris was mainly concentrated in the upper levels of the light brown clay. Pottery and lithics suggest the major occupation of the site was during the Initial Woodland Period. The site appears to represent a small transient camp.

Elevation: 0-15 feet above the mid-summer water level.

Site No.: UNR47

Priority: A

Location: Wuskwatim Lake; Lat. $55^{\circ} 30' 55''$ Long. $92^{\circ} 34' 30''$

Site Description: The site is located on a point along the south shore of Wuskwatim Lake close to the mouth of Wuskwatim Brook. The point lies due south of the Wuskwatim Fish camp which is situated on the opposite shore. The point consists of a small hillock displaying rock outcrops and a low, poorly drained area behind connecting the hillock to the mainland. There was a large quantity of fish detritus on the shore and the remains of an old drying rack on the surface. Early historic debris was found on the hillock or higher parts of the site.

Vegetation: Some areas are open due to recent disturbance. The dominant vegetation is grass or herbaceous shrubs on the open areas and aspen, birch and jack pine on the undisturbed areas.

Stratigraphy: A thin humic layer over a brown, pebbly, homogeneous silt (0-6 cms.) over bedrock. Further back on the point, the stratigraphy was similar although the silt was black and deposition much deeper (0-50 cms.).

Cultural Debris: Subsurface hearths were encountered producing trade beads, pottery, arrowheads, and clay pipe fragments. One hearth produced a square-head nail and trade beads. Hearths are frequent and much

deeper than normally encountered. One feature was stratified having thin clay layers between ash lenses. All the cultural material suggest multiple occupations during the Early Historic Period.

Elevation: 0-10 feet above the late summer water level.

Site No.: UNR48

Priority: A

Location: Wuskwatim Lake; Lat. $55^{\circ} 30' 5''$ Long. $98^{\circ} 35' 00$

Site Description: The site is located on a low-lying granitic outcrop situated on the southern tip of a peninsula in the south-west area of Wuskwatim Lake. There is a small island system adjacent to the tip. To the immediate west are low granitic bluffs and a small cove with a second beach. The site is positioned on three terraces, with a succession of ground cover characteristics. A rock beach is present at the extreme southern part of the site. A recent log cabin is located on the upper terrace.

Vegetation: On the lower terrace, grass and shrubs are the predominant vegetational forms. Tree cover characterizes the two upper terraces, with black spruce, willow, and trembling aspen being the dominant types. The site periphery has dominant tree forms of aspen and white birch.

Soil History/Depositional Environment: The site area is characterized by three terraces, each with a 5 foot rise in elevation occurring at relatively regular intervals. Terrace 1, the lowest terrace, is mainly a silt over bedrock formation with cobbles observed throughout the silt matrix.*

Terrace 2 has a clay base underlying the silt layer which decreases in depth towards the western periphery. This decrease in the silt layer is further exaggerated in Terrace 3 which has a predominant matrix of cobbles and nuggety clay. The silt layer here is relatively absent. Although this area is subject to recent occupation, the soil is relatively undisturbed, allowing good archaeological data recovery.

Elevation: The maximum elevation of the site is 10 meters above the August water level. This is observed on Terrace 3. Cultural material was recovered from all areas between the water level and the 10 m. level.

Cultural Description: The density of cultural material diminishes as one proceeds inland up the terraces, as most of the material was recovered from the silt matrix. On the basis of lithic and ceramic artifacts and metal items, Initial Woodland, Terminal Woodland, and Historic cultural components can be identified.

*Terraces 1 and 2 both have numerous exposed granitic outcrops as well as hummocks of well-developed primary soils.

Site No.: UNR50

Priority: A

Location: Wuskwatim Lake; Lat. $55^{\circ} 36' 45''$ Long. $98^{\circ} 36' 55''$

Site Description: The site is located on a small point along the left bank of the Burntwood River about 1/2 mile before the entrance to Wuskwatim Lake. The flat open area is bordered by low rock outcrops. Vegetation consists of some dogwood, rosebush and wild raspberry with poplar and birch bordering the river on the higher areas behind the point. There was a great deal of modern debris scattered over the site including a tent frame and snowshoes. The site is directly across from UNR51.

Stratigraphy: There appears to be little subsurface disturbance at the site as illustrated by Feature 1. Generally there is a homogeneous black silt (15-30 cm.) over bedrock.

Cultural Material: Feature 1 was a shallow, stone lined, basin-shaped fire pit found below the thin moss cover (0-5 cms.). Associated in the pit fill was a trade bead, Terminal Woodland ceramics, a flint lock and trade pipe fragments. Other test units placed on the site also produced a great deal of Early Historic material.

Elevation: 0-10 feet above the late summer water level.

Site No.: UNR53

Priority: A

Site Location: On portage, south shore of Wuskwatim Lake. Lat. $55^{\circ} 29' 15''$
Long. $98^{\circ} 38' 30''$

Site Description: The site is located adjacent to a portage path which starts at the shore of Wuskwatim Brook. The site is approximately 2 miles inland from the shore and is located in a small clearing.

Vegetation: The dominant vegetation in the clearing is a combination of black spruce and trembling aspen. Heavy moss cover is evident on the floor of the clearing. Small bushes were also present in the clearing.

Soil History/Depositional Environment: Due to the surface context of the site it was inadvisable to place test units by the dancing ring. Thus, little is known of the immediate area's depositional environment. The region all along the path is characteristic of a creek/swamp ecosystem.

Elevation: The location of the site when plotted on map contour intervals indicate an elevation of approximately 10 feet above water level. This area is well below the proposed water index tables.

Cultural Description: The site is composed of a circular sand path with a humic area in the center. Recent camp debris and hearths were observed in the adjacent areas to the circle. The circle itself is in an undisturbed context. Local informants told the survey team that the circle was used as a dancing ring up until two generations ago.



PLATE I Sand Beach on Threepoint Lake.



PLATE II Creek System, Notigi Lake.



PLATE III High, Steep Clay Banks, Opegano Lake.



PLATE IV Low Outcrop-Shore Edge on Wapisu Lake.



PLATE V Small Stone Hearth, Lower Levels of UNR23.

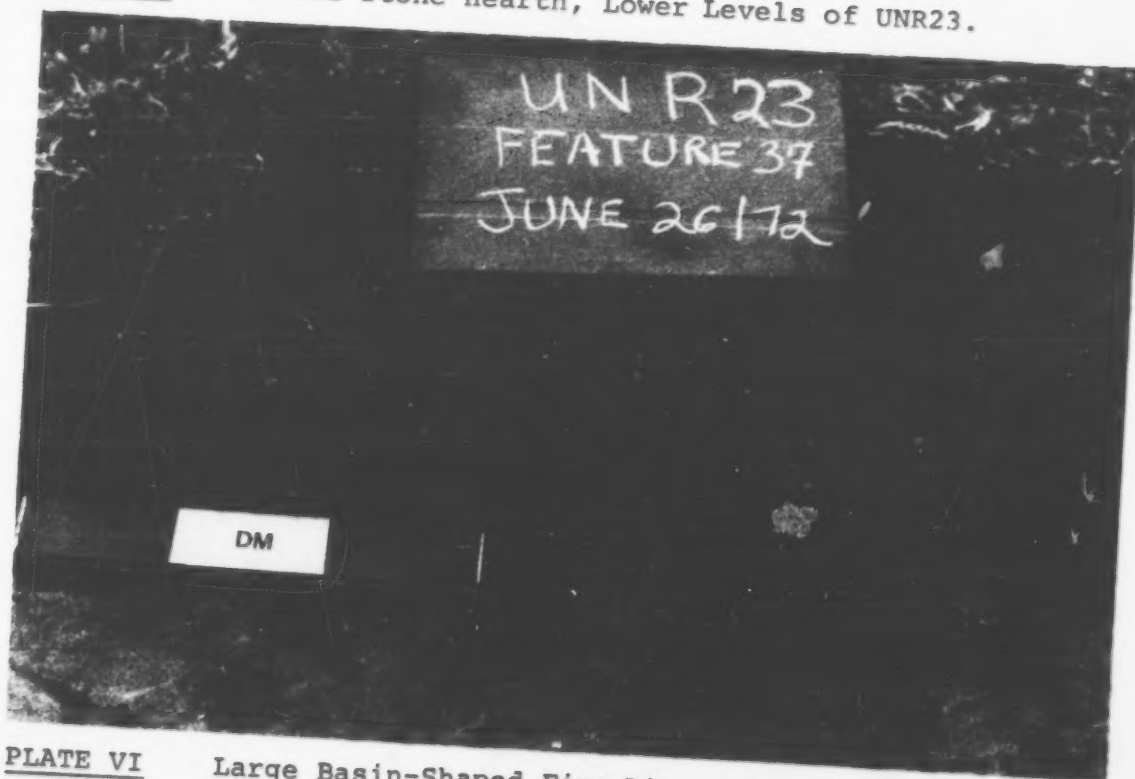


PLATE VI Large Basin-Shaped Fire Pit, UNR23, Notigi Lake.



PLATE VII Feature 63, Post Mold, UNR23, Notigi Lake.

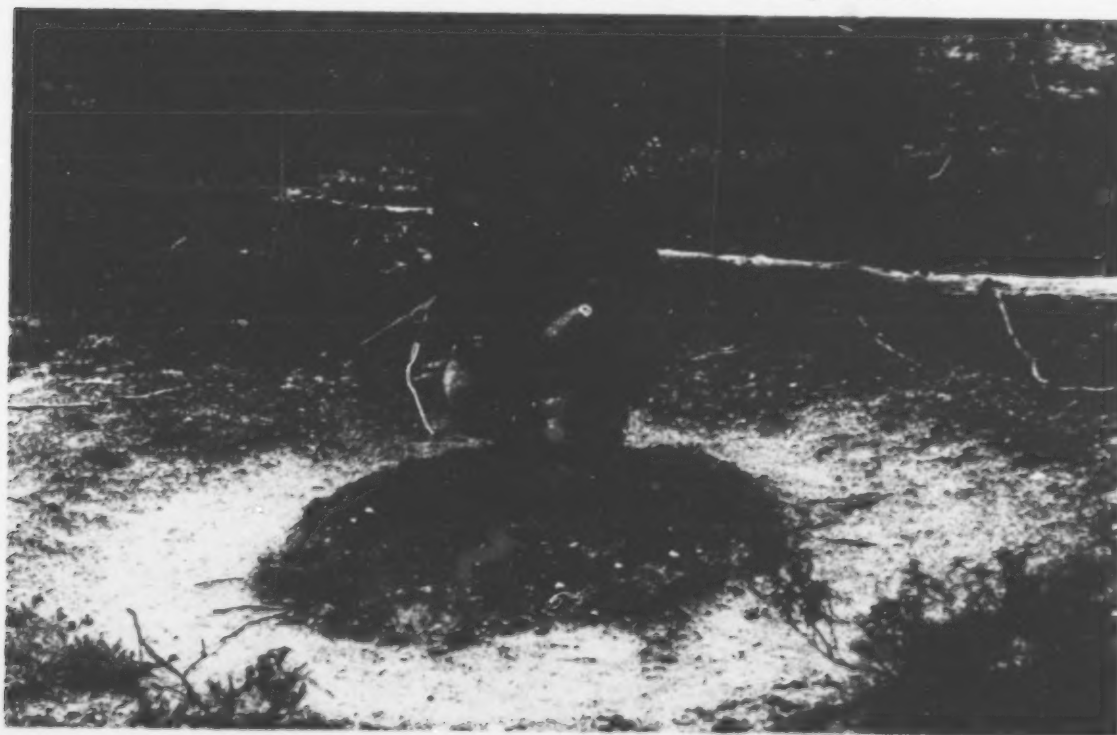


PLATE VIII Cree Dancing Circle, Wuskwatim Lake.



PLATE IX Modern Portage Trail Leading to Cree Dancing Circle,
Wuskwatim Lake, Closed Forest.



PLATE X Low Covered Rock Piles on Historic UNR4, Threepoint
Lake.



PLATE XI Small Clay Beach near UNR43, Threepoint Lake.

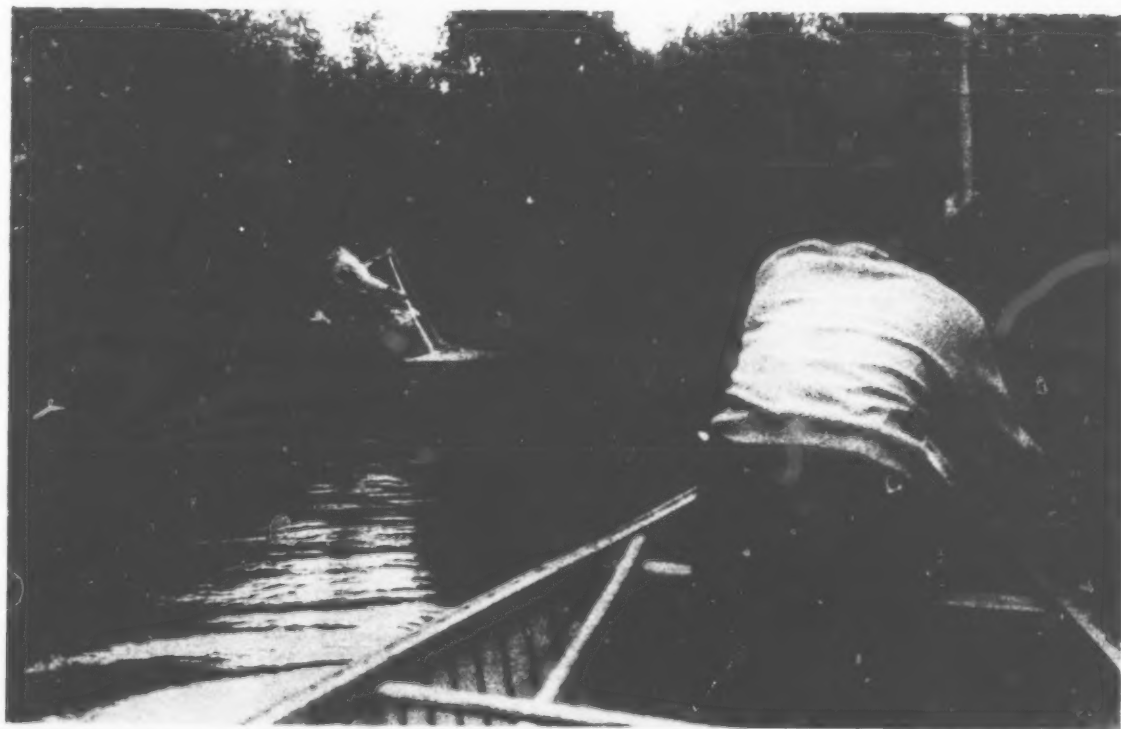


PLATE XII Surveying the Creek System, Notigi Lake.

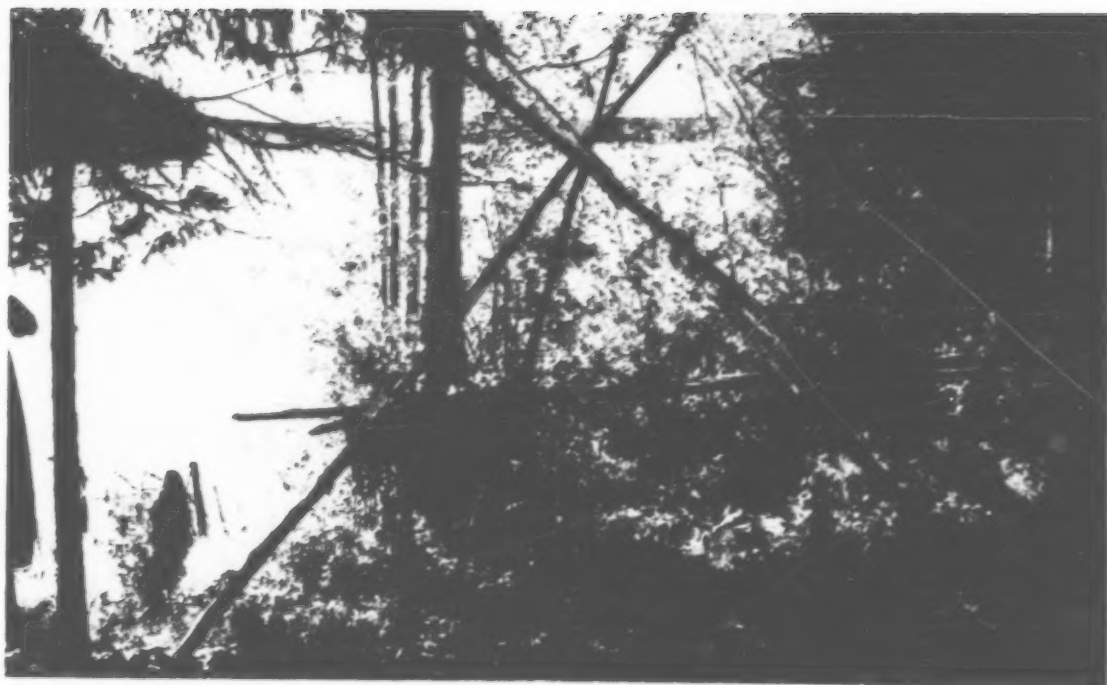


PLATE XIII Recent Structures, Smoking Rack, Reflects Contemporary Use of Shoreline Habitats, Wapisu Lake.



PLATE XIV Recent Cabin near Shore, Notigi Lake.



PLATE XV Testing Low Area Behind Outcrop on Island, Threepoint Lake.

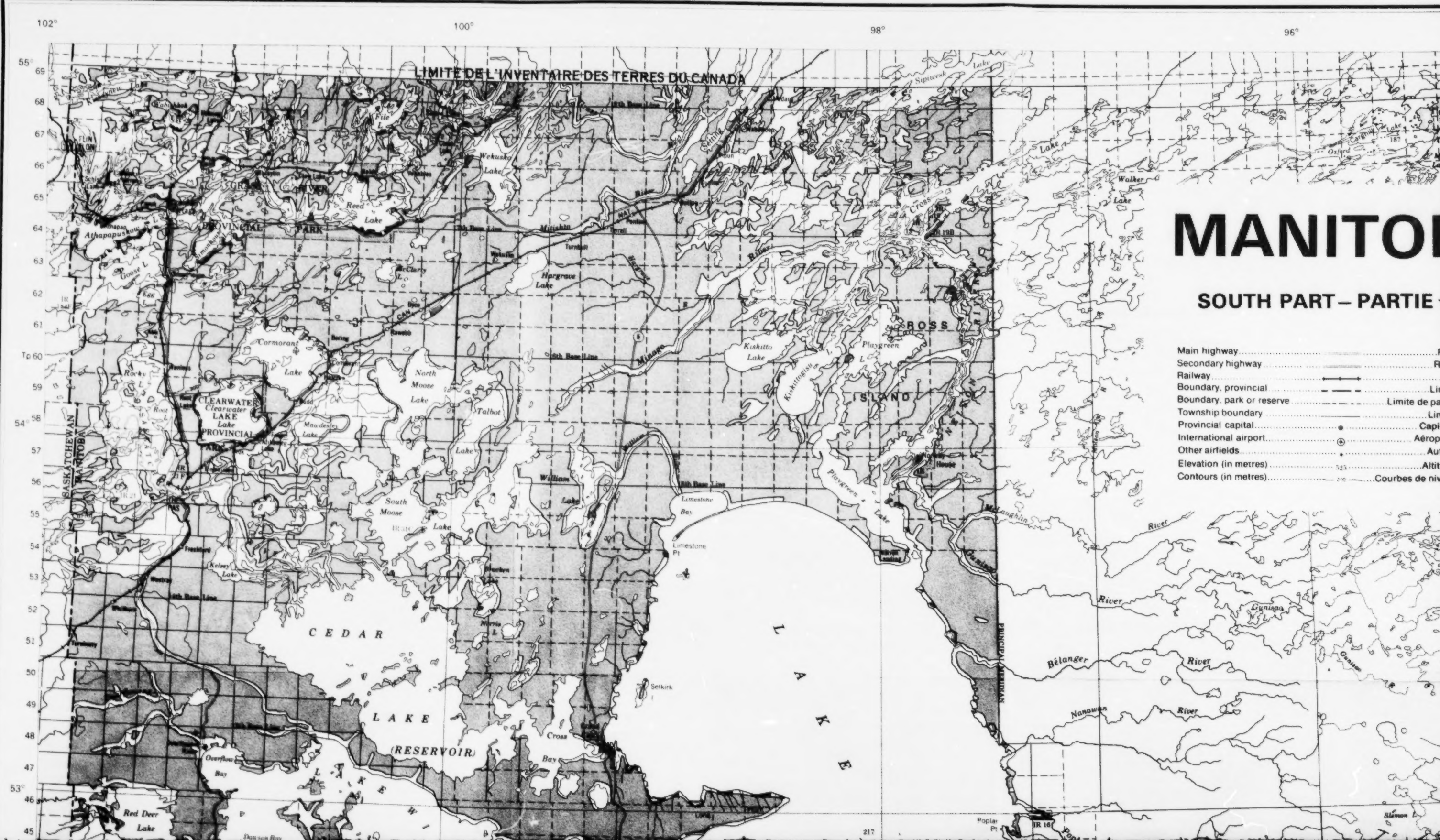


PLATE XVI Low, Marsh Lined Bank, Dense Vegetation, Rat River.

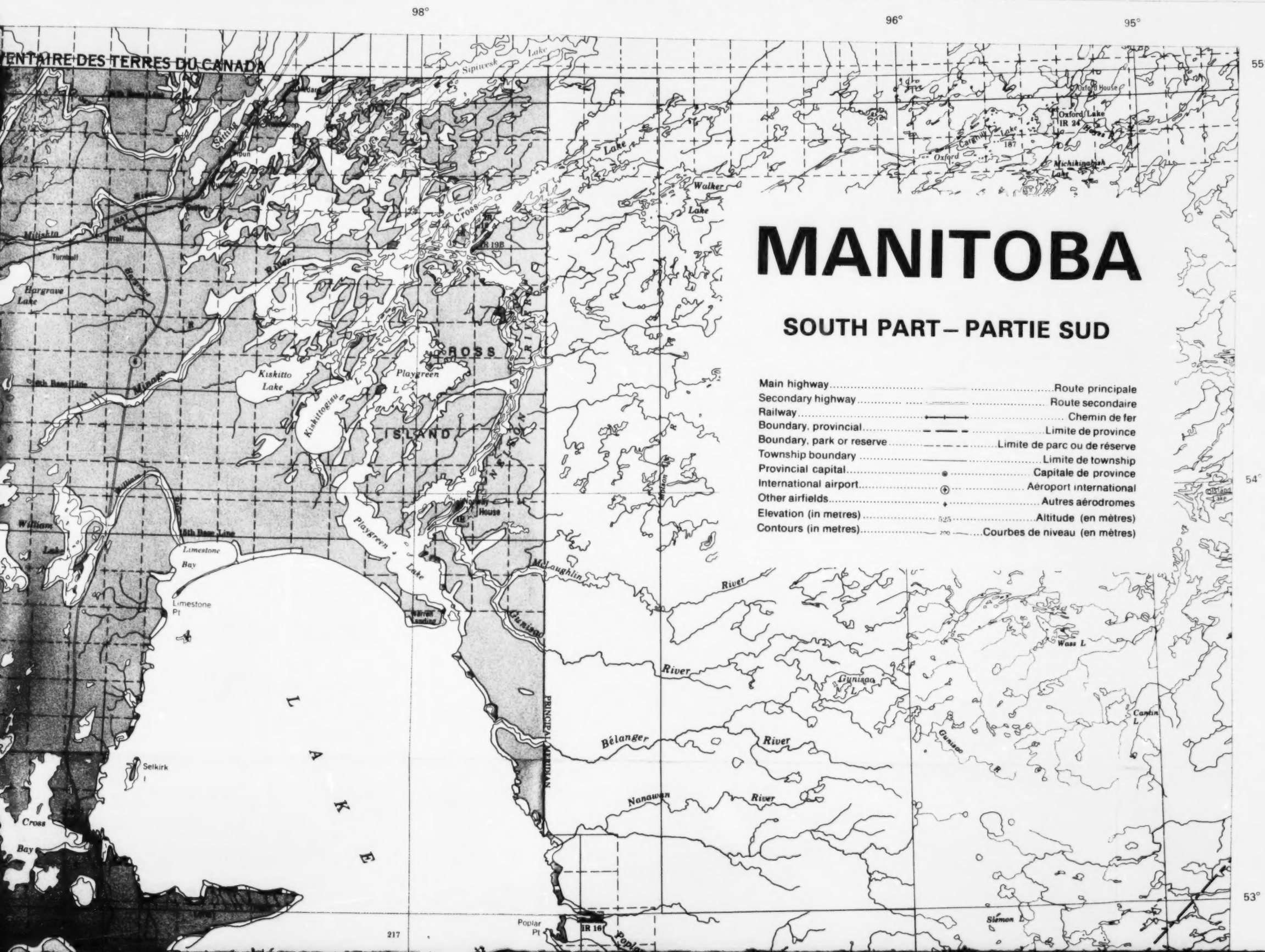
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CANADA LAND INVENTORY LAND CAPABILITY FOR OUTDOOR RECREATION



LEGEND

The Canada Land Inventory Land Capability for Outdoor Recreation map at the 1:1,000,000 scale is a generalization of the previously published 1:250,000 scale maps. The 1:250,000 maps differentiate seven classes of land on the basis of intensity or quantity of outdoor recreation use, that may be generated and sustained per unit area of land per year under perfect market conditions.

"Quantity" may be measured by visitor days, a visitor day being any reasonable portion of a 24-hour period during which an individual person uses a unit of land for recreation.

"Perfect market conditions" implies uniform demand and accessibility for all areas, which means that location relative to population centers and present access do not affect the classification.

Intensive and dispersed activities are recognized. Intensive activities are those in which relatively large numbers of people may be accommodated per unit area, and dispersed activities are those that normally require a relatively larger area per person.

In the generalization of the 1:250,000 maps to a 1:1,000,000 scale, the seven land classes have been combined into four groups. This grouping emphasizes the relationships between land with high and low capability for outdoor recreation.

LANDS THAT HAVE HIGH TO VERY HIGH CAPABILITY FOR OUTDOOR RECREATION

Class 1 and 2 lands have a natural capability to engender and sustain high to very high total annual use for one or more intensive recreational activities.

LANDS THAT HAVE MODERATELY HIGH CAPABILITY FOR OUTDOOR RECREATION

Class 3 lands have a natural capability to engender and sustain moderately high total annual use for intensive or moderately intensive activities.

LANDS THAT HAVE MODERATE TO MODERATELY LOW CAPABILITY FOR OUTDOOR RECREATION

Class 4 and 5 lands have a natural capability to engender and sustain moderate to moderately low total annual use for dispersed activities.

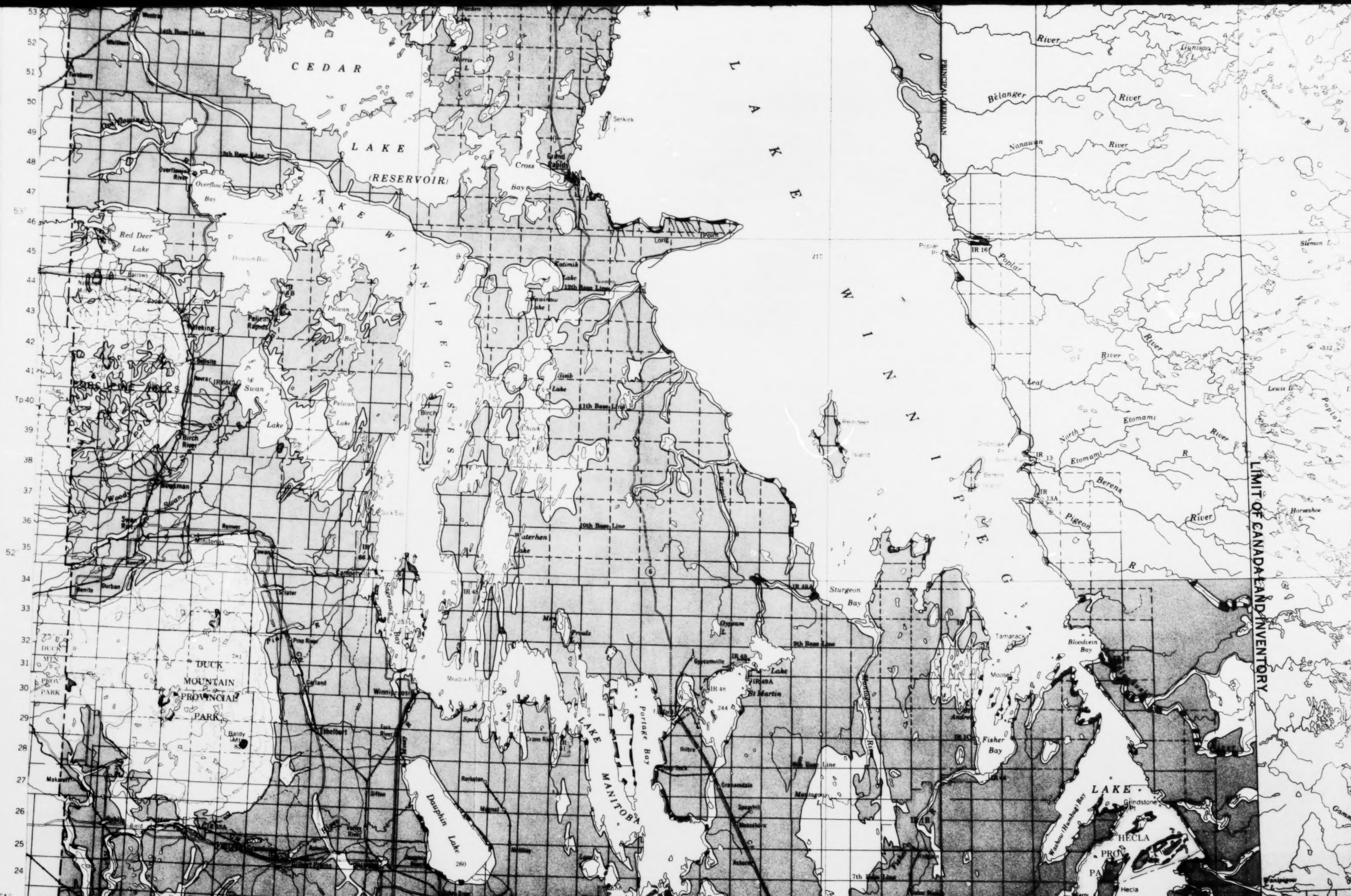
LANDS THAT HAVE LOW TO VERY LOW CAPABILITY FOR OUTDOOR RECREATION

Class 6 and 7 lands have a natural capability to engender and sustain low total annual use for dispersed activities, or have capability only for very specialized recreational activities, or simply provide open space.

At the 1:250,000 scale, subclasses are designated within each unit to indicate the dominant outdoor recreational activities or features that collectively determine the class of the unit. A general description accompanies each map to explain and amplify the mapped information.

At the 1:1,000,000-scale it is impossible to totally represent this information. The user is therefore referred to the 1:250,000 map sheet. Some important factors concerning the outdoor recreation capability inventory are:

- The purpose of the inventory is to provide a reliable assessment of the quality, quantity, and distribution of the natural recreation resources within the settled parts of Canada.
- The inventory is essentially of a reconnaissance nature, based on interpretation of aerial photographs, field checks, and available records, and the maps should be interpreted accordingly.
- The inventory classification is designed in accordance with present popular preferences in nonurban outdoor recreation. Urban areas (permanent population generally over 1000) and some nonurban industrial areas have not been classified.
- Land is rated according to its capability to support recreation in its present natural or modified state; no assumptions are made concerning its capability given major modifications in the future.
- Sound recreation land management and development practices are assumed for all areas in practical relation to the natural capability of each area.
- Water bodies are not directly classified. Recreational values are assigned to the adjoining shoreland or land unit.
- Opportunities for recreation afforded by the presence of wildlife and sport fish in an area are indicated where reliable information was available, but the rating does not reflect the biological productivity of the area. Wildlife capability is indicated in a companion series of maps.



LIMIT OF CANADA LAND INVENTORY



- Some important factors concerning the selection of the study area are:
- The purpose of the inventory is to provide a reliable assessment of the quality, quantity, and distribution of the natural recreation resources within the settled parts of Canada.
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LÉGENDE

Dressée à l'échelle de 1:1 000 000^e, cette carte des possibilités récréatives de plein air des terres est une version condensée réunissant les cartes au 1:250 000^e déjà publiées. Sur ces dernières, les terres sont réparties en sept classes selon le volume d'utilisation qui peut être obtenu et soutenu à des fins de récréations de plein air dans une section de terre donnée au cours d'une année, dans des conditions idéales de marché.

Le «volume d'utilisation» peut être mesuré en jours-visiteurs, un jour-visiteur représentant toute partie raisonnable d'une période de 24 heures au cours de laquelle une personne utilise une section de terre à des fins récréatives.

«Des conditions idéales de marché» impliquent que la demande et les possibilités d'accès sont les mêmes pour toutes les régions. Par conséquent, l'emplacement par rapport aux centres urbains et aux voies d'accès existantes n'influe aucunement sur le classement.

On fait une distinction entre les activités intensives et les activités multidimensionnelles. Les activités intensives sont celles qui peuvent être pratiquées par un nombre relativement élevé de personnes dans une section de terre, tandis que les activités multidimensionnelles sont celles qui exigent une plus grande superficie par personne.

Sur la carte condensée à l'échelle de 1:1 000 000^e, les sept classes ont été combinées en quatre groupes. Ce regroupement fait mieux ressortir les différences existant entre les terres dont les possibilités sont fortes pour la récréation de plein air, et celles dont les possibilités sont faibles.

TERRES PRÉSENTANT DE BONNES OU TRÈS BONNES APTITUDES RÉCRÉATIVES DE PLEIN AIR

Les terres classées 1 et 2 offrent des avantages naturels aptes à faire naître et à soutenir une ou plusieurs activités intensives, découlant d'une forte ou très forte utilisation annuelle globale.

TERRES PRÉSENTANT D'ASSEZ BONNES APTITUDES RÉCRÉATIVES DE PLEIN AIR

Les terres de classe 3 offrent des avantages naturels aptes à faire naître et à soutenir des activités intensives ou passablement intensives, découlant d'une utilisation annuelle globale moyennement forte.

TERRES PRÉSENTANT DE MOYENNES OU D'ASSEZ FAIBLES APTITUDES RÉCRÉATIVES DE PLEIN AIR

Les terres classées 4 et 5 offrent des avantages naturels aptes à faire naître et à soutenir des activités multidimensionnelles, découlant d'une utilisation annuelle globale d'une intensité moyenne ou moyennement faible.

TERRES PRÉSENTANT DE FAIBLES OU TRÈS FAIBLES APTITUDES RÉCRÉATIVES DE PLEIN AIR

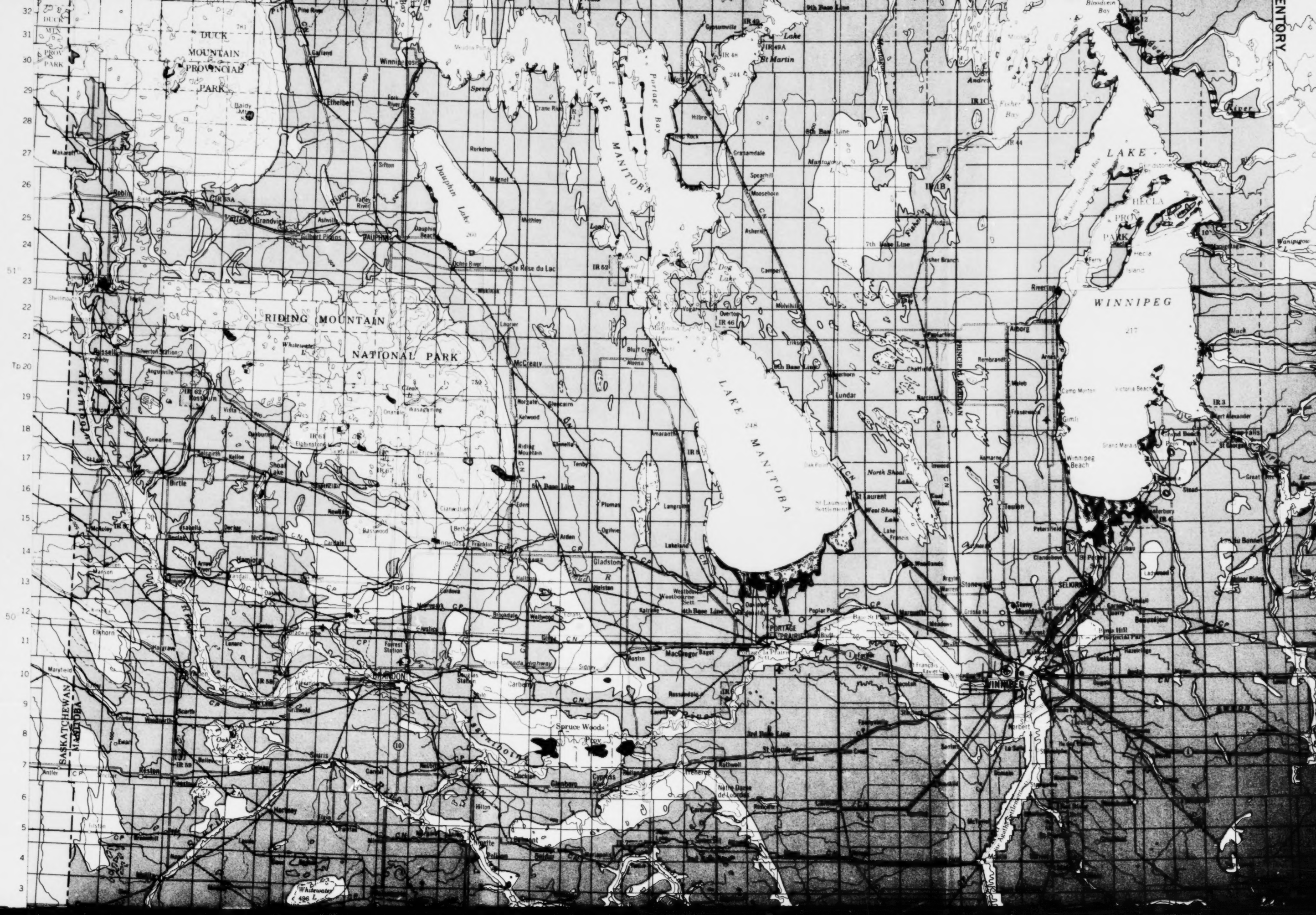
Les terres classées 6 et 7 offrent des avantages naturels aptes à faire naître et à soutenir des activités multidimensionnelles, découlant d'une faible utilisation annuelle globale, ou peuvent se prêter à certaines activités très spéciales ou offrir simplement de l'espace.

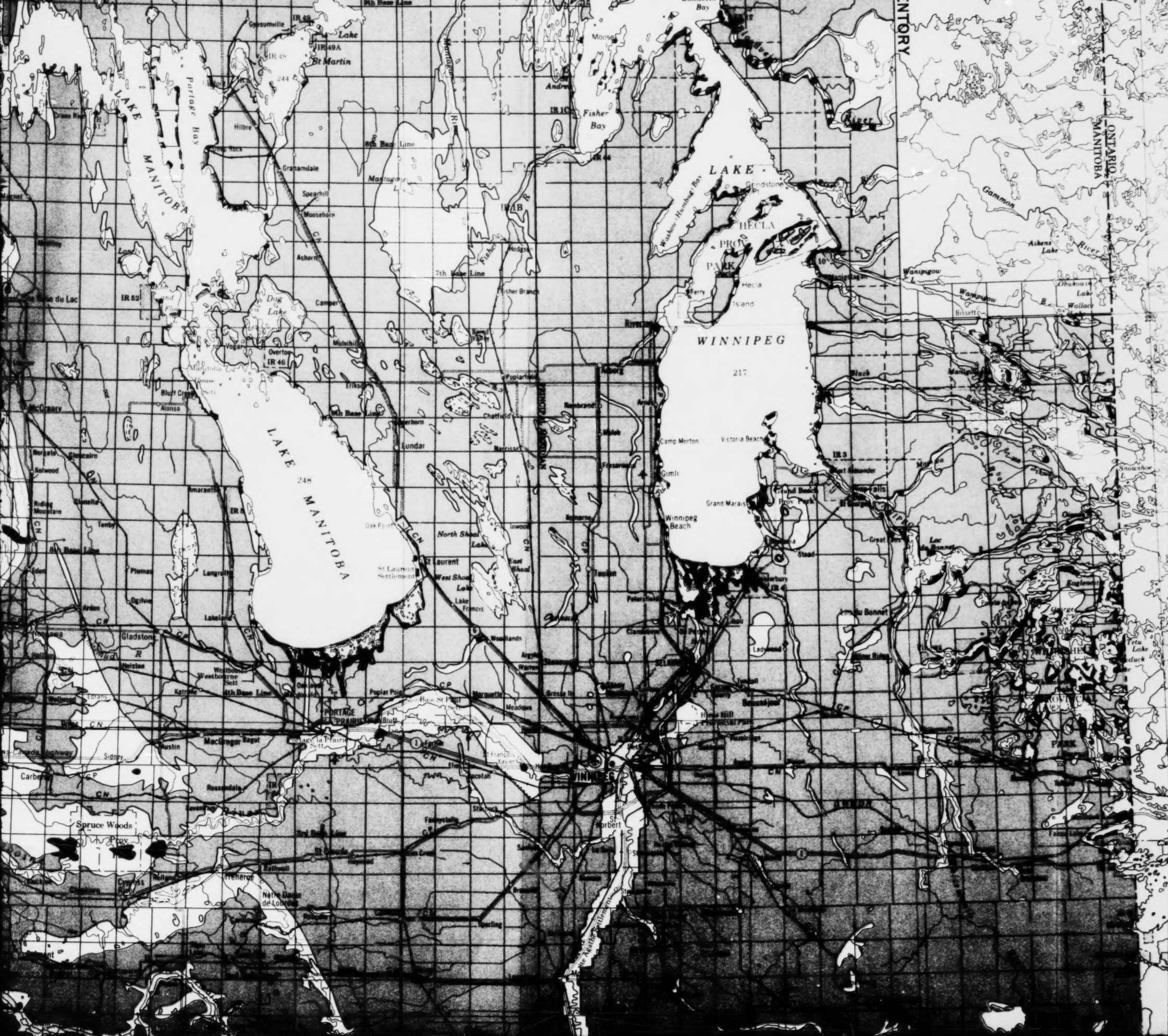
Sur les cartes au 1:250 000^e, les sous-classes sont indiquées dans chaque section selon les loisirs de plein air ou les caractéristiques dominantes qui, dans leur ensemble, déterminent la classe. Une description générale accompagne chaque carte, interprétant et amplifiant les renseignements cartographiques.

À l'échelle de 1:1 000 000^e, il est impossible de reproduire tous les détails figurant sur les cartes au 1:250 000^e. Au besoin, on se reportera à ces dernières.

Voici quelques-unes des notions importantes concernant le classement des terres selon leurs possibilités pour les récréations de plein air:

- Le but de l'inventaire est d'offrir une évaluation sûre de la qualité, du volume d'utilisation et de l'emplacement des zones propres aux récréations de plein air dans les régions habitées du Canada.
- L'inventaire est essentiellement une étude d'exploration fondée sur l'interprétation de photographies aériennes, de vérifications sur place et





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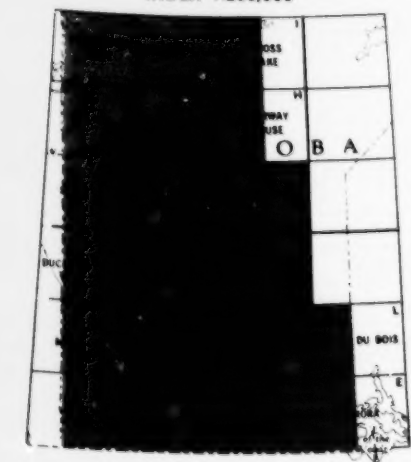
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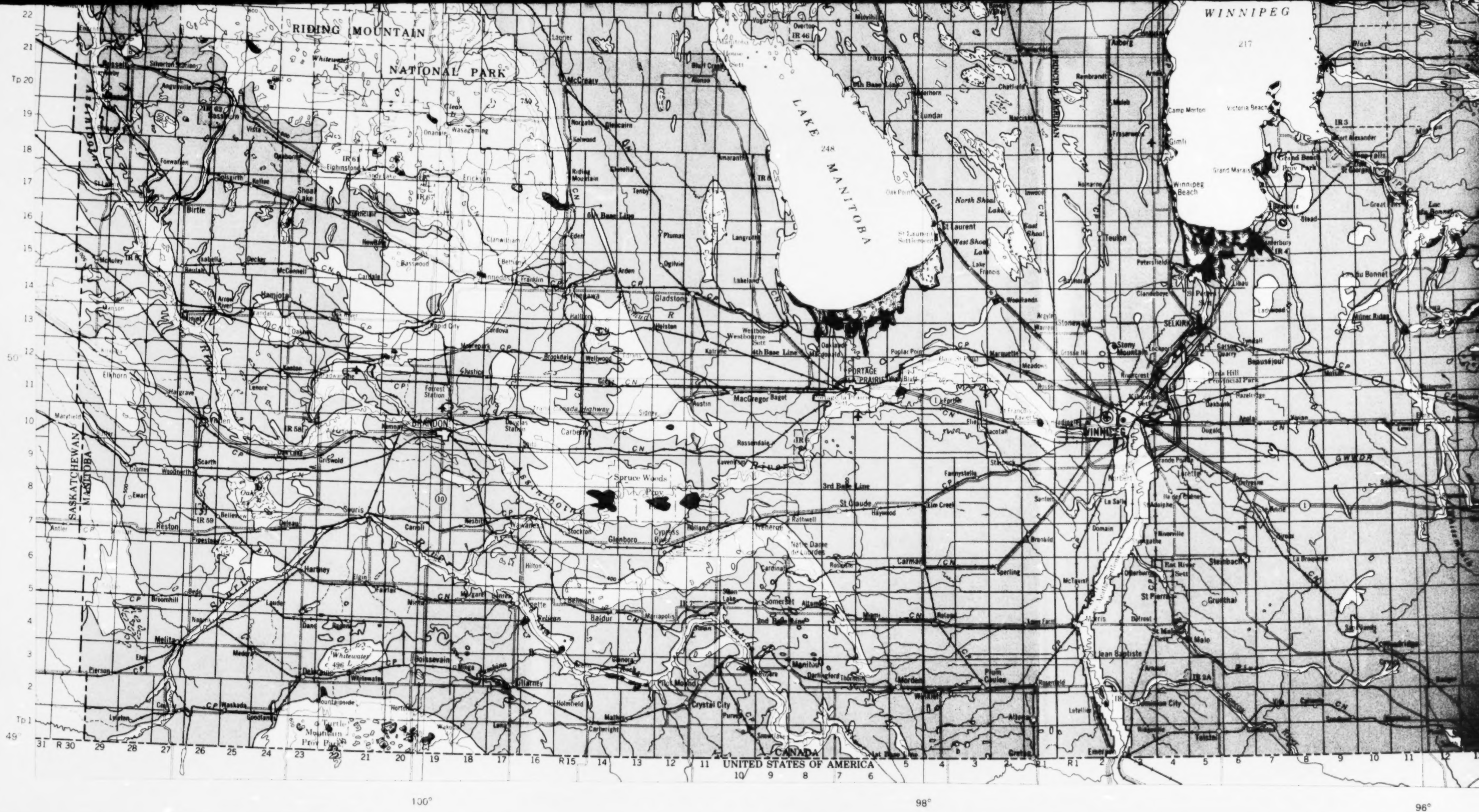
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- L'inventaire est essentiellement une étude d'exploration fondée sur l'interprétation de photographies aériennes, de vérifications sur place et de données disponibles. On doit donc interpréter les cartes en conséquence.
- Le classement de l'inventaire est établi en fonction des préférences populaires actuelles dans le domaine des récréations de plein air non urbaines. Les secteurs urbains (dont la population est généralement supérieur à 1 000 habitants) et certains secteurs industriels non urbains ne sont pas classés.
- Les terres sont classées d'après leur potentiel récréatif en fonction des conditions existantes, qu'elles aient fait ou non l'objet d'aménagements; il n'est pas tenu compte des possibilités qu'elles pourraient offrir si on y apportait d'importantes améliorations.
- On suppose que chaque ressource récréative fait l'objet d'une saine gestion et d'un aménagement judicieux, tenant compte des possibilités naturelles de chaque secteur.
- Les masses d'eau comme telles ne sont pas classées. Leur valeur récréative est attribuée au rivage ou à la section de terre qu'elles baignent.
- La faune aquatique et terrestre n'est indiquée comme ressource récréative d'un secteur donné que sur la foi de sources sûres, et le classement ne reflète pas la productivité du secteur du point de vue biologique. Les possibilités des terres pour la faune sont indiquées dans une autre série de cartes.

INDEX 1:250,000

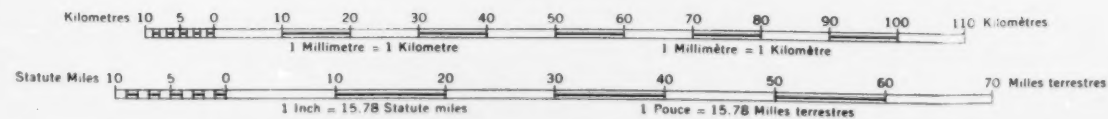




Cartographie réalisée par l'Institut de recherche sur les sols, Direction de la recherche, Agriculture Canada, avec l'aide de la Direction générale des Terres, Gestion de l'Environnement, Environnement Canada. Carte de base et impression réalisée par la Direction des levés et de la cartographie, ministère de l'Énergie, des Mines et des Ressources, Ottawa, 1974.

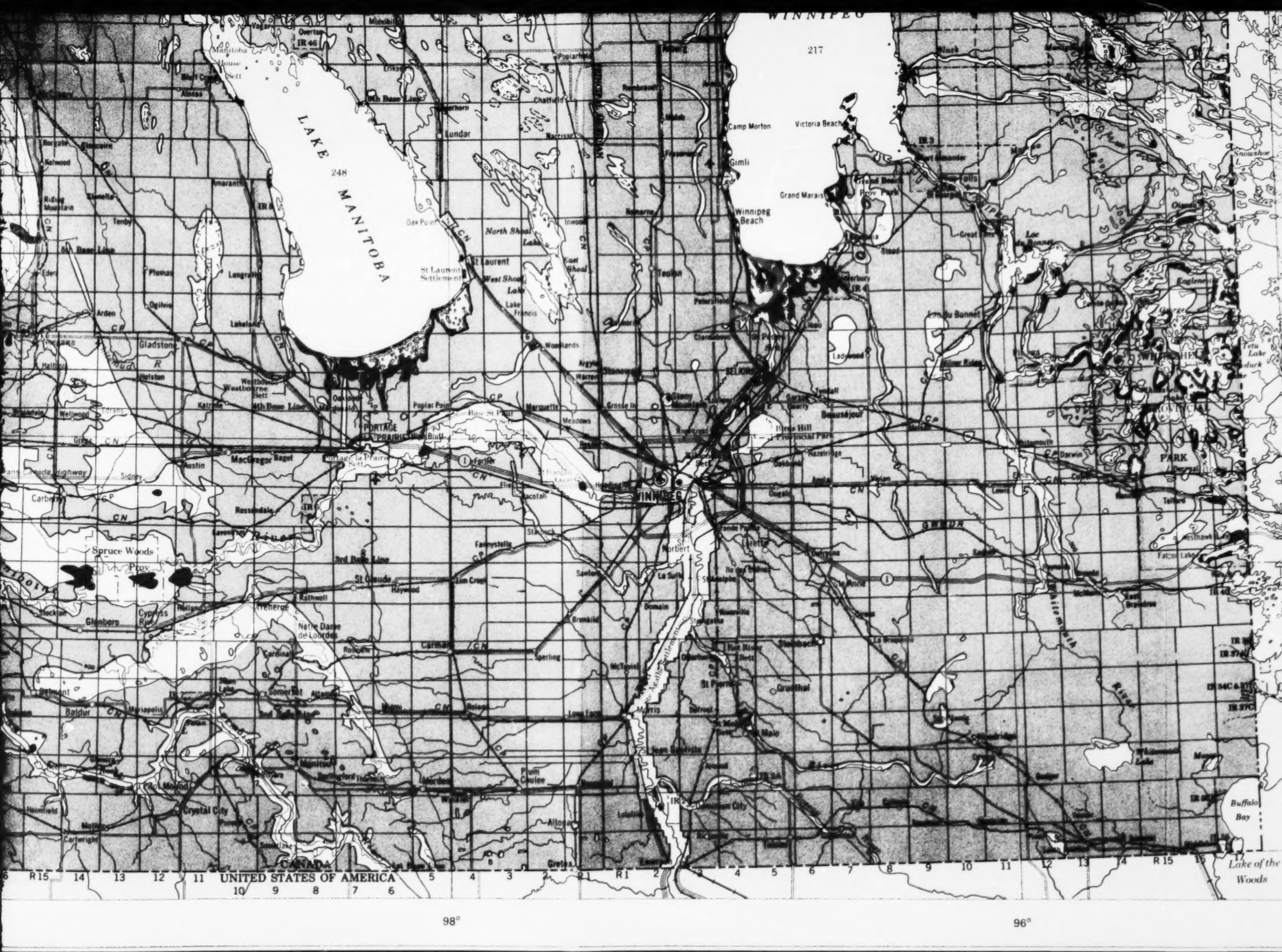
Établi par l'Inventaire des terres du Canada, Direction générale des Terres, Environnement Canada, d'après l'inventaire des ressources récréatives effectué par le Projet de l'inventaire des terres du Canada, ministère des Mines, des Ressources et de l'Aménagement de l'Environnement du Manitoba.

SCALE 1:1,000,000 ÉCHELLE



Cartography by the Soil Research support of the Lands Directorate Base map and printing by the Survey and Resources, Ottawa, 1974.

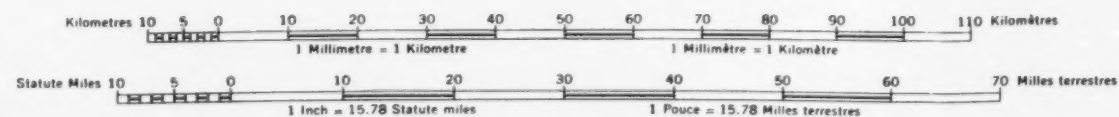
Compiled by the Canada Land recreation capability inventory Department of Mines, Resources



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Cartography by the Soil Research Institute, Research Branch, Agriculture Canada, with the support of the Lands Directorate, Environmental Management Service, Environment Canada. Base map and printing by the Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa, 1974.

Compiled by the Canada Land Inventory, Lands Directorate, Environment Canada from the recreation capability inventory provided by the Canada Land Inventory Project, Manitoba Department of Mines, Resources and Environmental Management.